#### REMARKS

Applicants submit herewith a Supplemental Information Disclosure Statement listing recently issued (July 3, 2001) U.S. Patent No. 6,255,059, entitled, "Methods for Identifying G Protein Coupled Receptor Effectors."

### I. Response to Restriction Requirement

In response to a restriction requirement mailed on June 24, 1999, Applicants provisionally elected Group I, claims 1- 18, 33-34, 39-40 without traverse. On November 13, 2000 and March 29, 2001, Applicants filed Amendments which canceled claims 1-18, inclusive, and added new claims 45-68. Claims 33, 34, 39, 40 and 45-68 are now pending and are subject to a new restriction.

In the Restriction Requirement, the Office has required Applicants to elect for examination one of what it considered to be 147 patentably distinct inventions. To summarize, the Office has indicated that each Location/Correlated Physiological Function in amended claims 33 and 39 are distinct and therefore subject to restriction.

Applicants provisionally elect herein "species" 116 encompassing "Location: ventromedial hypothalamus, Correlated with Physiological Function: food intake," and request that the non-elected "species" (1-115 and 117-147) be cancelled as indicated above. In making this election, Applicants take no legal position with respect to the view taken by the Office regarding the alleged distinctions between the 147 delineated "species." The Office has made this restriction based upon its view that a search of these "species" would create an undue burden on the Office. Applicants respectfully assert that only the Office is able to make this assumption. Nevertheless, Applicants are legally required to make an election in order to allow prosecution on the merits to continue.

U.S. Ser. No.: 09/060,188

Docket No.: AREN-0039

Applicants reserve the right to prosecute the "species" encompassed by any of the non-elected Location/Correlated Physiological Function in future divisional applications.

Notwithstanding the foregoing, Applicants respectfully submit that the 147 "species" of Group I set forth by the Office are amenable to further grouping and that such further grouping would not impose a serious burden on the Office.

In order for an application to be properly required to be restricted, there must be a serious burden on the Examiner (*see*, MPEP §803). Indeed, the MPEP states that if the search and examination of an entire application can be made without serious burden, the Office must examine it on the merits, even though it includes claims to independent or distinct inventions. Applicants propose an alternative combination of the "species" identified by the Examiner. "Species" 106, 114, 115 and 116 in claims 33 and 39 are all related to food intake. Therefore, based upon the common correlated physiological function, *i.e.*, food intake, Applicants believe that no serious burden exists in examining these species as one group and therefore respectfully request consideration of this request.

#### II. The Lewis Declaration

## A. Support for the Delineations in Claims 33 and 39

In the Restriction Requirement, the Office notes that "Although the Examiner will respond to the Applicants Amendments dated November 13, 2000 and March 29, 2001...Applicants are advised the Examiner can not find support for the Amended claims in the Specification." First, Applicants would like to thank the Examiner for the courtesy extended in reviewing these claims. Second, in specific response to the request by the Examiner, attention is drawn to the declaration of Michael Lewis, Ph.D. (hereinafter "Lewis Decla."), attached hereto as **Exhibit A**.

U.S. Ser. No.: 09/060,188

Docket No.: AREN-0039

Dr. Lewis is currently the President of BioDiligence Partners, Inc., in West Chester, Pennsylvania. Dr. Lewis is a co-founder of and Scientific Consultant to Arena Pharmaceuticals, Inc., the owner of the present patent application. Dr. Lewis is also the co-founder of several other pharmaceutical companies, for example, Cephalon, Inc., West Chester, PA and Adolor Corporation, Malvern, PA. In 1973, Dr. Lewis received his B.A. in Psychology at George Washington University, Washington, DC; his M.A. in Psychology at Clark University in Worcester, MA; and his Ph.D. in Psychology at Clark University. In addition, Dr. Lewis has been a journal referee for several journals, including: Biochemical Pharmacology; Brain Research; Endocrine Journal; Experimental Neurology; Molecular and Cellular Neurosciences; Proceedings of the National Academy of Sciences; and Science. (See, Lewis Delca. ¶1).

Dr. Lewis is familiar with G protein-coupled receptors ("GPCR") and the significance of the expression pattern of a GPCR as it relates to a physiological function. (See, Lewis Delca. ¶3). Dr. Lewis is familiar with the procedures and requirements for obtaining and securing a patent, and is therefore familiar with the phrase "new matter." Dr. Lewis has reviewed and is familiar with the present application, the previous correspondence between Applicants and the Office, and the Restriction Requirement issued by the Office. (See, Lewis Delca. ¶4).

Dr. Lewis declares that the designated "Location" and "Correlated Physiological Function" of claims 33 and 39 were known and reported in several scientific references prior to the April 14, 1997 filing date and that, in his opinion, "these relationships...were established, understood and recognized prior to the filing date of the present patent application." (See, Lewis Delca. ¶5).

The relationships between the receptor Location and the Correlated Physiological Function provided in claims 33 and 39, are within the broad disclosure of the originally filed patent application. Dr. Lewis opines that these location-function relationships are "exemplary of the

broad disclosure" as disclosed in the patent application. As noted by Dr. Lewis, quoting from the application,

"For example, scanning both diseased and normal tissue samples for the presence of a receptor now becomes more than an academic exercise or one which might be pursued along the path of identifying an endogenous ligand. Since, by definition, the endogenous ligand for an orphan receptor is not known, tissue scans can be conducted across a broad range of healthy and diseased tissues. Such tissue scans provide a preferred first step in associating a specific receptor, for which modulating compounds are now known, with a disease. The DNA sequence of a receptor may be used to make a probe for RT-PCR identification of the expression of the receptor in the tissue samples. The presence of the receptor in a diseased tissue, or the presence of the receptor at elevated concentrations in diseased tissue compared to a normal tissue strongly can be preferably utilized to identify a correlation with that disease. Receptors can equally well be localized to regions of organs by this technique. Based upon the known functions of the specific tissues to which the receptor is localized, the putative functional role of the receptor can be deduced." Page 33, line 25 to page 34, line 12 (emphasis supplied); see also, Lewis Decla. ¶9).

Therefore, in Dr. Lewis' opinion, the Location/Correlated Physiological Function relationship in claims 33 and 39 are exemplary of the broad disclosure as originally filed. (See, Lewis Decla. ¶9).

Extensive cross referencing is made by Dr. Lewis for each of the 147 Location/Correlated Physiological Function of claims 33 and 39 based upon Goodman & Gilman's, The Pharmacological Basis of Therapeutics, 9<sup>th</sup> Edition (1996), Harrison's, Principle of Internal Medicine, 13<sup>th</sup> Edition, (1994), Daube, J. et al. Medical Nerosciences, An Approach to Anatomy, Pathology and Physiology by Systems and Level (1978), Kandel, E. et al., Essentials of Neural Science and Behavior (1995), Kandel, E. et al., Principles of Neural Science, 3<sup>rd</sup> Edition (1991), Isaaccon, R., The Limbic System, 2<sup>nd</sup> Edition (1982), and several journals listed in Appendix B of Dr. Lewis' declaration. (See, Lewis Decla. ¶5, see also Appendix B of Lewis Decla.). Dr. Lewis has attached to his declaration on Appendix B a chart listing the Location and Correlated

Docket No.: AREN-0039

Physiological Function, as set forth in claims 33 and 39, together with the designated literature citation, all of which having publication dates prior to April 14, 1997 filing date.

Based upon review of the application as filed, the invention is focused on using receptors to directly identify candidate compounds based upon the compound efficacy of such compounds. Dr. Lewis opines that the "expression location of a receptor in a specific tissue can provide a scientist with the ability to determine the putative functional role of the receptor." (See, Lewis Decla. ¶6).

Dr. Lewis further declares that he has read the Declaration of Dr. Stanley J. Watson (the "Watson Declaration"), previously submitted and made of formal record in the application on November 13, 2000. Dr. Lewis notes that in the Watson Declaration, Dr. Watson discussed a GPCR designated by Arena with the code-name 18F, which was determined to be localized in an area of the brain, e.g., hypothalamus, which is associated with feeding, and that a small molecule candidate compound directly identified by the method of the claimed invention decreased food consumption when administered to animals. (See, Lewis Decla. 98). Dr. Lewis declares that the designated location of the 18F GPCR therein, i.e., ventromedial hypothalamus, identified as number 116 on Appendix B, is correlated with the physiological function of food intake. (See, Lewis Decla. ¶8). Upon applying the claimed invention to the 18F receptor, a candidate compound against the 18F receptor was directly identified as an inverse agonist, whereupon contacting the receptor with the directly identified candidate compound, the physiological function of the 18F receptor, food intake, was reduced. (See, Lewis Decla. 98). Dr. Lewis declares that the directly identified inverse agonist binds to the 18F receptor. Dr. Lewis further declares that he was informed and he believes that the 18F receptor is a receptor for which an endogenous ligand has not been identified. (See, Lewis Decla. ¶8).

U.S. Ser. No.: 09/060,188 -9- PATENT Docket No.: AREN-0039

## B. Support for Expansion of the Restriction Required

As declared by Dr. Lewis, other areas of the hypothalamus are associated with feeding. (See, Lewis Decla. Appendix B). For example, Dr. Lewis was provided with in situ hybridization data of a receptor referred to as 19AL. Upon review of the data, Dr. Lewis declares that the data shows that 19AL is located in the lateral hypothalamus, which, as set forth in number 106 in claims 33 and 39, is correlated with feeding. (See, Lewis Decla. ¶10; see also, Appendix B, number 106). This physiological function is the same as that set forth in number 116 on Appendix B where the regions for both functions are the within the hypothalamus. (See, Lewis Decla. ¶10). Inter alia, this information, with due respect, provides additional support to the Office for expanding the restriction as requested above.

## C. Compound Efficacy vs. "Binding Affinity"

According to the Specification, the phrase "compound efficacy" is defined as "a measurement of the ability of a compound to inhibit or stimulate the functional activity of the receptor, as opposed to receptor binding affinity." (See, Lewis Decla. ¶11; see also, page 18, lines 3 to 4 of the Specification). Dr. Lewis declares that the claimed invention does not rely upon the mere binding of the candidate compound to the receptor's endogenous ligand binding site (binding affinity). (See, Lewis Decla. ¶11). A compound directly identified by the claimed invention not only must bind to a receptor, but in Dr. Lewis' scientific opinion, the compound must inhibit or stimulate the function of a receptor. (See, Lewis Decla. ¶11). Further, based upon Dr. Lewis' education and work related experiences, Dr. Lewis opines that the compound efficacy is much more relevant in terms of the activity of a compound on the receptor than measuring the affinity for which a compound binds to a receptor's endogenous ligand binding site. (See, Lewis Decla. ¶11). Stated

U.S. Ser. No.: 09/060,188

Docket No.: AREN-0039

differently, a compound that has a strong affinity for a receptor may have little or no effect on the physiological function associated with the receptor, but as disclosed in the Specification, an "inverse agonist" or an "agonist" identified specifically defines the functional effect such a compound will have on the receptor. (See, Lewis Decla. ¶11). Dr. Lewis declares that the binding affinity of a compound for a receptor only defines the ability of the compound to bind to the receptor at the endogenous ligand binding site. (See, Lewis Decla. ¶11).

To clarify, Dr. Lewis declares that, in his scientific opinion, knowing the binding affinity will not define the functional activity of a compound, which is "much more significant" in identifying candidate compounds to a receptor. (*See*, Lewis Decla. ¶12).

#### D. Claims 33 and 39 As Amended And "Real World" Utility

In addition to the extensive scientific opinions provided in the Watson Declaration regarding the real world utility of the invention disclosed by the Applicants, Dr. Lewis also provides his scientific opinion on this issue. Claims 33 and 39 provide a step in which the candidate compound is placed in contact with a mammal comprising the receptor and confirming the increase or decrease of a physiological function against which the candidate compound was directly identified. In Dr. Lewis's opinion, an orphan receptor processed through the claimed invention is less of a "pure" orphan receptor because the candidate compound identified will bind to the receptor and alter a physiological function associated with that receptor. (See, Lewis Decla. ¶13). Dr. Lewis declares that although the candidate compound identified is not the endogenous ligand, in Dr. Lewis' scientific opinion the compound directly identified by the application of the claimed invention has a real world use because the compound will impact a defined physiological function in a mammal. (See, Lewis Decla. ¶13).

U.S. Ser. No.: 09/060,188 -11- PATENT

Docket No.: AREN-0039

III. Conclusion

Applicants respectfully submit that the foregoing arguments and amendments place this

application in condition for allowance. Applicants invite the Examiner to contact the undersigned to

clarify any unresolved issues raised by this response. The foregoing represents a bona fide attempt

to advance the present case to allowance. Applicants respectfully request early notification of the

same.

Respectfully submitted,

Ann A. Nguyen

Attorney for Applicants

Reg. No. 46,087

Attachments:

"Version with markings to show changes made"

# VERSION WITH WARKINGS TO SHOW CHANGES MADE

33 (Amended Four Times). A method for directly identifying a non-endogenous candidate compound as a compound having activity selected from the group consisting of inverse agonist activity and agonist activity to an endogenous G protein coupled cell surface receptor, wherein a location of expression of said receptor has been identified from a mammalian tissue source and has been correlated with at least one physiological function in a mammal, comprising the steps of:

- (a) selecting an endogenous G protein coupled cell surface receptor, wherein the endogenous ligand for said receptor has not been identified;
- (b) determining the location of expression of said receptor in a mammalian tissue source and correlating the expression location of said receptor with at least one mammalian physiological function of interest, wherein said location and said correlated physiological function are selected from the group consisting essentially of:

Location:	Correlated Physiological Function:
gastrointestinal tract     smooth muscle	motility of stomach and intestines
2. gastrointestinal tract ganglionic nerve fibers	2. motility of stomach and intestines
3. urinary tract smooth muscle	3. ureter function and urinary bladder function
4. salivary gland	4. salivary secretion
5. alpha cells of the pancreas	5. secretion of glucagon
6. beta cells of the pancreas	6. secretion of insulin
7. uterine smooth muscle	7. uterine contraction
8. heart muscle	8. contractility of heart muscle
9. vascular smooth muscle	9. contractility of smooth muscle
10. adipocytes	10. lipolysis
11. platelets	11. platelet aggregation in response to blood vessel injury
12. skeletal neuromuscular junction	12. skeletal muscle contractility
13. bronchial smooth muscle	13. respiration
14. nasal mucosal blood vessels	14. mucosa volume
15. trigone muscle of bladder and urethra	15. urinary outflow
16. chondrocytes	16. cartilage formation
17. ciliary body of the eye	17. aqueous humor production
18. thyroid	18. thyroid hormone secretion
19. mast cells	19. immediate hypersensitivity reactions
20. basophils	20. immediate hypersensitivity reactions
21. osteoblasts	21. bone remodeling
22. osteoclasts	22. bone remodeling
23. brain capillary endothelial cells	23. permeability of blood-brain barrier
24. T cells	24. immune response
25. B cells	25. immune response

26. kidney proximal tubular epithelial cells 26. organic acids exchange 27. neutrophils 27. immune response 28. eosinophils 28. immune response 29. monocytes 29. immune response 30. organic bases exchange 30. kidney late distal tubule 31. collecting duct principal cells 31. organic bases exchange 32. kidney granular juxtaglomerular cells 32. secretion of renin 33. sympathetic function 33. peripheral postganglionic adrenergic neurons 34. synthesis of cholesterol 34. hepatocytes and lipoprotein 35. secretion of stomach acid 35. gastrointestinal parietal cells secretion of cytoprotective factors, 36. gastrointestinal superficial epithelial mucus and bicarbonate cells 37. skin maintenance 37. epidermal cells 38. bone marrow stem cells 38. erythropoesis production 39. aqueous humor outflow 39. angle structures of the eye 40. uveoscleral structures of eye 40. aqueous humor outflow 41. circadian rhythm 41. suprachiasmatic nucleus 42. blood pressure 42. baroreceptors 43. movement control 43. basal ganglia 44. periaqueductal grey and dorsal horn of 44. nociception spinal cord 45. area postrema 45. vomiting 46. sensorimotor processing and arousal 46. thalamus 47. sensorimotor cerebral cortex 47. sensorimotor processing 48. motor function control 48. spinal cord motor neurons 49. sensory information transmission 49. dorsal root ganglion neurons 50. neuron myelin sheath production 50. oligodendrocytes 51. cognition and memory 51. nucleus basalis 52. addictive cravings 52. nucleus accumbens 53. lateral reticular formation of medulla 53. vomiting 54. secretion of GHRH hypothalamic neurons containing growth hormone releasing factor (GHRH) 55. secretion of somatostatin hypothalamic neurons containing 55. somatostatin 56. secretion of TRH hypothalamic neurons containing thyrotropin-releasing hormone (TRH) 57. secretion of GnRH hypothalamic neurons containing gonadotropin releasing hormone (GnRH)

hypothalamic neurons containing

corticotropin releasing factor (CRF)

59. anterior pituitary somatotropes60. anterior pituitary lactotropes

61. anterior pituitary gonadotropes

62. anterior pituitary gonadotropes

63. anterior pituitary corticotropes

58. secretion of CRF

62. se hormone

63. se hormone

60. secretion of prolactin

59. secretion of growth hormone

61. secretion of luteinizing hormone

secretion of follicle stimulating

secretion of adrenocorticotropic

Docket No.: AREN-0039

64. leydig cells of the testes 65. sertoli cells of the testes 66. granulosa cells of the tovary 66. granulosa cells of the ovary 67. theca cells of the ovary 68. synovium 69. amygdala 69. modulation of emotion 70. pineal gland 70. regulation of circadian rhythm 71. nucleus of the solitary tract 71. cardiovascular regulation 72. caudal ventrolateral medulla 73. rostral ventrolateral medulla 74. parabrachial nucleus 75. entorhinal cortex 76. cognition 77. temporal cortex 77. temporal cortex 78. frontal cortex 79. parietal cortex 80. occipital cortex 81. hippocampus 82. dentate gryus 83. midbrain reticular formation 84. supraoptic nucleus of the hypothalamus 85. magnocellular of the hypothalamus 86. parvocellular neurons of the hypothalamus 87. arcuate nucleus of the hypothalamus 88. trigeminal area 89. cerebral blood vessels 90. brain stem 90. brain stem 91. ventral lamina terminalis 91. ventral lamina terminalis 92. vagus nerve 93. nucleus of the bypothalamus 94. cerebral vessel dilation 95. serves and nesones of stress 96. locus coeruleus 97. substantia nigra 98. cerebral doord vessels 99. olfactory bulb 99. olfactory bulb 100. median eminence of hypothalamus 101. raphe nuclei 102. serval a darvity 102. serval a darvity 103. serval a darvity 103. serval and a recipion 104. serval and a recipion 105. serval and a recipion 106. serval and a recipion 107. serval and a recipion 107. serval and a recipion 108. serval and a recipion 109. politatry function 100. pinuitary function 101. septem and a recipion 102. serval a darvity 103. serval a darvity 104. serval a darvity 105. serval a darvity 105. serval a darvity 105. serval a darvity 106. serval a darvity	AREN-0037	
65. sertoli cells of the testes 66. granulosa cells of the ovary 67. theca cells of the ovary 68. synovium 69. amygdala 70. piecal gland 71. nucleus of the solitary tract 71. caudal ventrolateral medulla 72. cardiovascular regulation 73. rostral ventrolateral medulla 74. parabrachial nucleus 75. entorhinal cortex 76. pyriform cortex 77. temporal cortex 78. frontal cortex 79. parietal cortex 80. occipital cortex 81. hippocampus 82. dentate gyrus 83. midbrain reticular formation 84. supraoptic nucleus of the hypothalamus 85. magnocellular of the hypothalamus 86. parvocellular neurons of the hypothalamus 87. arcuate nucleus of the hypothalamus 88. trigeminal area 89. cerebral blood vessels 90. brain stem 90. brain stern 90. brain stern 91. ventral lamina terminalis 91. blood pressure 92. vagus nerve 93. blood pressure and heart rate 94. adrenal medulla 95. carcelolamine response to stress 96. locus coeruleus 97. carcelolamine response to stress 97. substantia nigra 97. control of body movement 98. ventral tegmental area 99. olfactory bulb 90. olfactory bulb 90. olfactory bulb 100. median eminence of hypothalamus 101. raphe nuclei	64. leydig cells of the testes	64. secretion of testosterone
66. granulosa cells of the ovary 67. theca cells of the ovary 68. synovium 68. synovium 69. amygdala 69. modulation of emotion 70. pineal gland 70. regulation of circadian rhythm 71. nucleus of the solitary tract 72. caudal ventrolateral medulla 73. rostral ventrolateral medulla 74. parabrachial nucleus 75. cognition 76. pyriform cortex 76. pyriform cortex 77. temporal cortex 78. frontal cortex 79. parietal cortex 79. parietal cortex 79. parietal cortex 80. occipital cortex 81. hippocampus 82. dentate gyrus 83. midbrain reticular formation 84. supraoptic nucleus of the hypothalamus 85. magnocellular of the hypothalamus 86. parvocellular neurons of the hypothalamus 87. arcuate nucleus of the hypothalamus 88. trigeminal area 89. cerebral blood vessels 90. brain stem 90. brain stem 91. ventral lamina terminalis 91. ventral lamina terminalis 92. vagus nerve 93. uotenal cortex 95. advanta neurons 96. arousal and response to stress 979. substantia nigra 979. parietal cortex 970. vagus arousal 970. occipital cortex 971. vagus arousal 972. vagus nerve 973. blood pressure 974. adrean medulla 975. cognition 976. pyrition 977. tempora acquisition 978. regulation of emotional response and memory acquisition 979. parietal cortex 970. visual acuity 970. visual acuity 970. visual acuity 970. visual acuity 970. suprable development of the hypothalamus 971. reproductive functions hypothalamus 972. reproductive functions hypothalamus 973. arcuate nucleus of the hypothalamus 974. reproductive functions 975. ocprition 976. pyrition 977. temporal advantage development 978. cerebral vessel dilation 979. brain stem 970. brain stem 971. ventral lamina terminalis 972. vagus nerve 973. blood pressure 974. catecholamine response to stress 975. substantia nigra 976. control of body movement 9770. pyrition 977. developmental area 978. ventral tegmental area 979. olifactory bulb 970. ontrol of body movement 979. olifactory bulb 970. offer of pyrothalamus 970. polifactory bulb 970. offer of pyrothalamus 970. polifactory bulb 970. offer of py		65. spermatogenesis
67. theca cells of the ovary 68. synovium 69. amygdala 69. modulation of emotion 70. pineal gland 70. pineal gland 71. nucleus of the solitary tract 71. cardiovascular regulation 72. caudal ventrolateral medulla 73. rostral ventrolateral medulla 73. rostral ventrolateral medulla 74. parabrachial nucleus 75. entorhinal cortex 76. pyriform cortex 77. temporal cortex 78. frontal cortex 79. parietal cortex 79. parietal cortex 79. parietal cortex 80. occipital cortex 80. occipital cortex 81. hippocampus 82. dentate gyrus 83. midbrain reticular formation 84. supraoptic nucleus of the hypothalamus 85. magnocellular neurons of the hypothalamus 86. parvocellular neurons of the hypothalamus 87. arcuate nucleus of the hypothalamus 88. trigeminal area 89. cerebral blood vessels 90. brain stem 90. brain stem 91. ventral lamina terminalis 91. ventral lamina terminalis 92. vagus nerve 93. nucleus of the solitary tract 94. adrenal medulla 94. catecholamine response to stress 95. adrenal cortex 99. offactory bulb 99. odor perception 100. median eminence of hypothalamus 101. raphe nuclei 101. sleep and arousal	66. granulosa cells of the ovary	
68. synovium 69. amygdala 69. modulation of emotion 70. pineal gland 70. pineal gland 71. nucleus of the solitary tract 71. cardiovascular regulation 72. caudal ventrolateral medulla 73. rostral ventrolateral medulla 74. parabrachial nucleus 75. entorhinal cortex 76. pyriform cortex 77. cognition 77. temporal cortex 78. frontal cortex 79. parietal cortex 79. parietal cortex 80. occipital cortex 81. hippocampus 82. dentate gyrus 83. midbrain reticular formation 84. supraoptic nucleus of the hypothalamus 85. magnocellular of the hypothalamus 86. parvocellular neurons of the hypothalamus 87. arcuate nucleus of the hypothalamus 88. trigeminal area 89. cerebral blood vessels 90. brain stem 89. ventral tamina terminalis 90. brain stem 90. brain stem 91. ventral lamina terminalis 92. vagus nerve 93. nucleus of the solitary tract 94. catecholamine response to stress 95. advanta cortex 96. locus coeruleus 979. sisual acuity 980. dentate gyrus 990. brain stem 991. ventral lamina terminalis 992. vagus nerve 993. nucleus of the solitary tract 994. adrenal medulla 995. advantal tergenal area 996. locus coeruleus 9977. substantia nigra 9977. control of body movement 9998. ventral tegmental area 999. olfactory bulb 990. odor perception 1001. median eminence of hypothalamus 1001. raphe nuclei 1001. raphe nuclei 1001. sleep and arousal		
69. amygdala 70. pineal gland 70. regulation of circadian rhythm 71. nucleus of the solitary tract 71. nucleus of the solitary tract 72. caudal ventrolateral medulla 73. rostral ventrolateral medulla 74. parabrachial nucleus 75. entorhinal cortex 76. entorhinal cortex 77. temporal cortex 77. temporal cortex 78. frontal cortex 79. parietal cortex 79. parietal cortex 80. occipital cortex 81. hippocampus 82. dentate gyrus 83. midbrain reticular formation 84. supraoptic nucleus of the hypothalamus 85. magnocellular of the hypothalamus 86. parvocellular neurons of the hypothalamus 87. arcuate nucleus of the hypothalamus 88. trigeminal area 89. cerebral blood vessels 90. brain stem 91. ventral lamina terminalis 91. ventral lamina terminalis 92. vagus nerve 93. nucleus of the solitary tract 94. adrenal medulla 94. catecholamine response to stress 95. adrenal cortex 96. locus coeruleus 97. substantian ingra 97. control of body movement 97. other parameters 98. control of body movement 99. visual acuity 91. selection of emotional response and memory acquisition 98. parietal cortex 99. dore precipion, and voluntary movement 99. visual acuity 90. brain stem 90. brain stem 91. ventral lamina terminalis 91. blood pressure 92. blood pressure 93. nucleus of the solitary tract 94. adrenal medulla 94. catecholamine response to stress 95. adrenal cortex 96. locus coeruleus 97. substantia nigra 97. control of body movement 98. ventral tegmental area 99. olfactory bulb 99. odor perception 100. median eminence of hypothalamus 101. raphe nuclei 101. sleep and arousal		
70. pineal gland 71. nucleus of the solitary tract 72. caudal ventrolateral medulla 72. cardiovascular regulation 73. rostral ventrolateral medulla 73. rostral ventrolateral medulla 74. parabrachial nucleus 75. entorhinal cortex 76. pyriform cortex 77. temporal cortex 78. frontal cortex 79. parietal cortex 79. parietal cortex 79. parietal cortex 79. visual acuity, touch perception, and voluntary movement 80. occipital cortex 81. learning and memory 82. dentate gyrus 83. midbrain reticular formation 84. supraoptic nucleus of the hypothalamus 85. magnocellular of the hypothalamus 86. parvocellular neurons of the hypothalamus 87. arcuate nucleus of the hypothalamus 88. trigeminal area 89. cerebral blood vessels 89. cerebral vessel dilation 90. brain stem 90. brain stem 91. ventral lamina terminalis 92. vagus nerve 93. nucleus of the solitary tract 94. adrenal medulla 95. control of body movement 96. locus coeruleus 96. locus coeruleus 97. supraoptic nucleus 98. cerebral cortex 99. stress-induced corticosterone release 96. locus coeruleus 97. supraoptic nucleus 98. cerebral planta terminalis 99. ventral tegmental area 99. stress-induced corticosterone release 96. locus coeruleus 97. substantia nigra 97. control of body movement 98. ventral tegmental area 99. olafactory bulb 90. median eminence of hypothalamus 100. petituitary function 100. median eminence of hypothalamus 100. pituitary function 101. raphe nuclei		69. modulation of emotion
71. nucleus of the solitary tract 72. caudal ventrolateral medulla 73. rostral ventrolateral medulla 74. parabrachial nucleus 75. entorhinal cortex 76. pyriform cortex 77. temporal cortex 78. frontal cortex 79. parietal cortex 79. parietal cortex 79. parietal cortex 80. occipital cortex 81. hippocampus 82. dentate gyrus 83. midbrain reticular formation 84. supraoptic nucleus of the hypothalamus 85. magnocellular of the hypothalamus 86. parvocellular neurons of the hypothalamus 87. arcuate nucleus of the hypothalamus 88. trigeminal area 89. cerebral blood vessels 90. brain stem 89. ventral lamina terminalis 90. brain stem 91. ventral lamina terminalis 92. vagus nerve 93. adrenal cortex 94. steas of pytothalamus 95. stress-induced corticosterore release 96. locus coeruleus 97. supraoptic nucleus 99. odor perception 100. median eminence of hypothalamus 99. odor perception 100. median eminence of hypothalamus 99. odor perception 100. median eminence of hypothalamus 99. odor perception 100. pituitary function 100. raphe nuclei 101. stepp and arousal		
72. caudal ventrolateral medulla       72. cardiovascular regulation         73. rostral ventrolateral medulla       73. vasopressor activity         74. taste aversion response and nociceptive response         75. entorhinal cortex       75. cognition         76. pyriform cortex       76. cognition         77. temporal cortex       77. memory acquisition         78. frontal cortex       78. regulation of emotional response and memory acquisition         79. parietal cortex       79. visual acuity, touch perception, and voluntary movement         80. occipital cortex       80. visual acuity         81. hippocampus       81. learning and memory         82. dentate gyrus       82. learning and memory         83. midbrain reticular formation       83. arousal         84. supraoptic nucleus of the hypothalamus       84. reproductive functions         85. magnocellular of the hypothalamus       85. modulation of stress, blood pressure and lactation         86. parvocellular neurons of the hypothalamus       86. metabolism         87. release of pituitary hormones       87. release of pituitary hormones         88. trigeminal area       88. cerebral vessel dilation         90. brain stem       90. breathing, heart rate, startle responses, sweating, blood pressure, digestion and body temperature         91. ventral lamina terminalis       91. blood pressure and heart ra		
73. rostral ventrolateral medulla 74. parabrachial nucleus 75. entorhinal cortex 76. pyriform cortex 77. temporal cortex 78. frontal cortex 79. parietal cortex 79. parietal cortex 79. parietal cortex 80. occipital cortex 81. hippocampus 82. dentate gyrus 83. midbrain reticular formation 84. supraoptic nucleus of the hypothalamus 85. magnocellular of the hypothalamus 86. parvocellular neurons of the hypothalamus 87. arcuate nucleus of the hypothalamus 88. trigeminal area 89. cerebral blood vessels 89. brain stem 89. ventral lamina terminalis 90. brain stem 90. brain stem 91. ventral lamina terminalis 92. vagus nerve 93. nucleus of the solitary tract 94. adrenal medulla 94. catecholamine response to stress 95. adrenal cortex 99. odor perseption 99. odor perseption 99. offactory bulb 99. odor perception 100. median entience of hypothalamus 100. pituitary function 101. raphe nuclei 101. sleep and arousal		
74. taste aversion response and nociceptive response 75. entorhinal cortex 76. pyriform cortex 77. temporal cortex 78. frontal cortex 79. parietal cortex 79. parietal cortex 80. occipital cortex 81. hippocampus 82. dentate gyrus 83. midbrain reticular formation 84. supraoptic nucleus of the hypothalamus 85. magnocellular neurons of the hypothalamus 86. parvocellular neurons of the hypothalamus 87. arcuate nucleus of the hypothalamus 88. trigeminal area 89. cerebral blood vessels 89. cerebral vessel dilation 90. brain stem 91. ventral lamina terminalis 92. vagus nerve 93. nucleus of the solitary tract 94. adrenal medulla 94. catecholamine response to stress 96. locus coeruleus 97. substantia nigra 98. ventral tegmental area 99. odor perception 99. odor perception, and voluntary movement 99. odor perception 99. brain stem 99. odor perception 90. iscept and arousal		
nociceptive response   75. cognition   76. pyriform cortex   75. cognition   77. temporal cortex   76. cognition   77. temporal cortex   77. memory acquisition   78. frontal cortex   78. regulation of emotional response and memory acquisition   79. parietal cortex   79. visual acuity, touch perception, and voluntary movement   80. occipital cortex   80. visual acuity   81. learning and memory   82. dentate gyrus   82. learning and memory   83. midbrain reticular formation   83. arousal   84. reproductive functions   85. magnocellular of the hypothalamus   85. magnocellular neurons of the hypothalamus   86. parvocellular neurons of the hypothalamus   87. arcuate nucleus of the hypothalamus   88. cerebral vessel dilation and blood pressure   89. cerebral blood vessels   89. cerebral vessel dilation   90. brain stem   90. breathing, heart rate, startle responses, sweating, blood pressure   92. vagus nerve   92. blood pressure   93. nucleus of the solitary tract   93. blood pressure   94. adrenal medulla   94. catecholamine response to stress   95. adrenal cortex   95. stress-induced corticosterone release   96. locus coeruleus   96. arousal and response to stress   97. substantia nigra   97. control of body movement   99. olfactory bulb   99. odor perception   100. pituitary function   101. raphe nuclei   101. sleep and arousal   100. pituitary function   101. raphe nuclei   101. raph		
75. entorhinal cortex 76. pyriform cortex 77. temporal cortex 78. frontal cortex 78. frontal cortex 79. parietal cortex 79. parietal cortex 79. visual acuity, touch perception, and voluntary movement 80. occipital cortex 81. hippocampus 82. dentate gyrus 83. midbrain reticular formation 84. supraoptic nucleus of the hypothalamus 85. magnocellular of the hypothalamus 86. parvocellular neurons of the hypothalamus 87. arcuate nucleus of the hypothalamus 88. trigeminal area 89. cerebral blood vessels 89. cerebral vessel dilation 90. brain stem 90. brain stem 91. ventral lamina terminalis 91. blood pressure 92. vagus nerve 93. nucleus of the solitary tract 94. adrenal medulla 95. darenal cortex 96. arousal and hemory 97. control of body movement 98. cerebral vessel of particular personse to stress 96. arousal and response to stress 97. substantia nigra 98. ceretory bulb 99. odor perception 100. median eminence of hypothalamus 100. pituitary function 101. raphe nuclei 101. sleep and arousal	7 1. paraoraeman masieus	
76. pyriform cortex       76. cognition         77. temporal cortex       77. memory acquisition         78. frontal cortex       78. regulation of emotional response and memory acquisition         79. parietal cortex       79. visual acuity, touch perception, and voluntary movement         80. occipital cortex       80. visual acuity         81. hippocampus       81. learning and memory         82. dentate gyrus       82. learning and memory         83. midbrain reticular formation       83. arousal         84. supraoptic nucleus of the hypothalamus       84. reproductive functions hypothalamus         85. magnocellular of the hypothalamus       85. modulation of stress, blood pressure and lactation         86. parvocellular neurons of the hypothalamus       86. metabolism         87. release of pituitary hormones       88. cerebral vessel dilation and blood pressure         88. trigeminal area       88. cerebral vessel dilation         89. brain stem       90. brain, heart rate, startle responses, sweating, blood pressure, digestion and body temperature         91. ventral lamina terminalis       91. blood pressure         92. vagus nerve       92. blood pressure and heart rate         93. nucleus of the solitary tract       93. blood pressure         94. adrenal medulla       94. catecholamine response to stress         95. stress-induced corticosterone releas	75 entorhinal cortex	
77. temporal cortex  78. frontal cortex  78. frontal cortex  79. parietal cortex  79. parietal cortex  80. occipital cortex  81. hippocampus  82. dentate gyrus  83. midbrain reticular formation  84. supraoptic nucleus of the hypothalamus  85. magnocellular neurons of the hypothalamus  86. parvocellular neurons of the hypothalamus  87. arcuate nucleus of the hypothalamus  88. trigeminal area  89. cerebral blood vessels  89. cerebral vessel dilation  89. brain stem  89. ventral lamina terminalis  91. ventral lamina terminalis  92. vagus nerve  93. nucleus of the solitary tract  94. adrenal medulla  95. safenal cortex  96. locus coeruleus  97. substantia nigra  98. central tegmental area  99. olfactory bulb  100. median eminence of hypothalamus  179. visual acuity, touch perception, and memory voluntary novement  880. visual acuity  881. learning and memory  882. learning and memory  883. arousal  844. reproductive functions  855. modulation of stress, blood pressure and lactation  866. metabolism  870. release of pituitary hormones  887. release of pituitary hormones  888. cerebral vessel dilation and blood pressure  899. cerebral vessel dilation  900. breathing, heart rate, startle responses, sweating, blood pressure, digestion and body temperature  91. ventral lamina terminalis  91. blood pressure  92. blood pressure and heart rate  93. blood pressure  94. catecholamine response to stress  95. stress-induced corticosterone release  96. locus coeruleus  97. control of body movement  98. ventral tegmental area  99. olfactory bulb  100. pituitary function  100. pituitary function		
78. frontal cortex  79. parietal cortex  79. parietal cortex  80. occipital cortex  81. hippocampus  82. dentate gyrus  83. midbrain reticular formation  84. supraoptic nucleus of the hypothalamus  85. magnocellular neurons of the hypothalamus  86. parvocellular neurons of the hypothalamus  87. arcuate nucleus of the hypothalamus  88. trigeminal area  89. cerebral blood vessels  90. brain stem  91. ventral lamina terminalis  91. ventral lamina terminalis  92. vagus nerve  93. nucleus of the solitary tract  94. adrenal medulla  95. adrenal cortex  96. locus coeruleus  97. substantia nigra  98. central tegmental area  99. olfactory bulb  100. median eminence of hypothalamus  78. regulation of emotional response and memory acquisition  79. visual acuity, touch perception, and voluntary movement  80. visual acuity  81. learning and memory  82. learning and memory  83. arousal  84. reproductive functions  85. modulation of stress, blood pressure and lactation  86. metabolism  87. release of pituitary hormones  88. cerebral vessel dilation and blood pressure  99. breathing, heart rate, startle responses, sweating, blood pressure, digestion and body temperature  91. blood pressure  92. blood pressure and heart rate  93. nucleus of the solitary tract  94. adrenal medulla  94. catecholamine response to stress  95. stress-induced corticosterone release  96. locus coeruleus  97. control of body movement  98. ventral tegmental area  99. olfactory bulb  100. pituitary function  101. sleep and arousal		
memory acquisition  79. parietal cortex  79. visual acuity, touch perception, and voluntary movement  80. occipital cortex  81. hippocampus  81. learning and memory  82. dentate gyrus  83. arousal  84. supraoptic nucleus of the hypothalamus  85. magnocellular of the hypothalamus  86. parvocellular neurons of the hypothalamus  87. arcuate nucleus of the hypothalamus  88. trigeminal area  89. cerebral blood vessels  90. brain stem  90. brain stem  91. ventral lamina terminalis  92. vagus nerve  93. nucleus of the solitary tract  94. adrenal medulla  95. adrenal cortex  96. locus coeruleus  97. substantia nigra  98. control of body movement  99. odor perception  100. reaphe nuclei  101. raphe nuclei  101. raphe nuclei		
79. visual acuity, touch perception, and voluntary movement	7.5. 2.5.1.1.1	
voluntary movement   80. occipital cortex   80. visual acuity   81. hippocampus   81. learning and memory   82. dentate gyrus   82. learning and memory   83. midbrain reticular formation   84. supraoptic nucleus of the hypothalamus   85. magnocellular of the hypothalamus   85. magnocellular neurons of the hypothalamus   86. parvocellular neurons of the hypothalamus   87. release of pituitary hormones   88. trigeminal area   88. cerebral vessel dilation and blood pressure   89. cerebral blood vessels   89. cerebral vessel dilation   90. brain stem   90. breathing, heart rate, startle responses, sweating, blood pressure   91. ventral lamina terminalis   91. blood pressure   92. vagus nerve   92. blood pressure   93. nucleus of the solitary tract   93. blood pressure   94. adrenal medulla   94. catecholamine response to stress   95. adrenal cortex   95. stress-induced corticosterone release   96. locus coeruleus   96. arousal and response to stress   97. substantia nigra   97. control of body movement   98. ventral tegmental area   98. control of body movement   99. olfactory bulb   99. odor perception   100. median eminence of hypothalamus   101. sleep and arousal	79. parietal cortex	79. visual acuity, touch perception, and
80. occipital cortex 81. hippocampus 82. dentate gyrus 83. midbrain reticular formation 84. supraoptic nucleus of the hypothalamus 85. magnocellular of the hypothalamus 86. parvocellular neurons of the hypothalamus 87. arcuate nucleus of the hypothalamus 88. trigeminal area 89. cerebral blood vessels 90. brain stem 91. ventral lamina terminalis 92. vagus nerve 93. nucleus of the solitary tract 94. adrenal medulla 95. adrenal cortex 96. locus coeruleus 97. substantia nigra 98. control of body movement 99. olfactory bulb 100. median eminence of hypothalamus 101. raphe nuclei		
81. hippocampus 82. dentate gyrus 83. midbrain reticular formation 84. supraoptic nucleus of the hypothalamus 85. magnocellular of the hypothalamus 86. parvocellular neurons of the hypothalamus 87. arcuate nucleus of the hypothalamus 88. trigeminal area 89. cerebral blood vessels 90. brain stem 91. ventral lamina terminalis 92. vagus nerve 93. nucleus of the solitary tract 94. adrenal medulla 95. adrenal cortex 96. locus coeruleus 97. control of body movement 98. ventral tegmental area 99. olfactory bulb 100. pituitary function 101. raphe nuclei	80 occipital cortex	
82. dentate gyrus 83. midbrain reticular formation 84. supraoptic nucleus of the hypothalamus 85. magnocellular of the hypothalamus 86. parvocellular neurons of the hypothalamus 87. arcuate nucleus of the hypothalamus 88. trigeminal area 89. cerebral blood vessels 89. cerebral blood vessels 89. cerebral vessel dilation 90. brain stem 91. ventral lamina terminalis 91. ventral lamina terminalis 92. vagus nerve 93. nucleus of the solitary tract 94. adrenal medulla 95. adrenal cortex 96. locus coeruleus 97. substantia nigra 98. ventral tegmental area 99. olfactory bulb 99. odor perception 100. median eminence of hypothalamus 180. magna memory 84. arcuate functions 85. modulation of stress, blood pressure 86. metabolism 87. release of pituitary hormones 88. cerebral vessel dilation and blood pressure 90. breathing, heart rate, startle responses, sweating, blood pressure, digestion and body temperature 91. blood pressure 92. blood pressure 93. blood pressure 94. catecholamine response to stress 95. stress-induced corticosterone release 96. arousal and response to stress 97. control of body movement 98. ventral tegmental area 99. olfactory bulb 99. odor perception 100. median eminence of hypothalamus 101. sleep and arousal		
83. midbrain reticular formation   84. supraoptic nucleus of the hypothalamus   85. magnocellular of the hypothalamus   85. modulation of stress, blood pressure and lactation   86. parvocellular neurons of the hypothalamus   87. arcuate nucleus of the hypothalamus   87. release of pituitary hormones   88. trigeminal area   88. cerebral vessel dilation and blood pressure   89. cerebral blood vessels   89. cerebral vessel dilation   90. breathing, heart rate, startle responses, sweating, blood pressure, digestion and body temperature   91. ventral lamina terminalis   91. blood pressure   92. blood pressure and heart rate   93. nucleus of the solitary tract   93. blood pressure   94. adrenal medulla   94. catecholamine response to stress   95. adrenal cortex   95. stress-induced corticosterone release   96. locus coeruleus   97. control of body movement   98. ventral tegmental area   98. control of body movement   99. olfactory bulb   99. odor perception   100. median eminence of hypothalamus   100. pituitary function   101. raphe nuclei   101. sleep and arousal		
84. supraoptic nucleus of the hypothalamus  85. magnocellular of the hypothalamus  86. parvocellular neurons of the hypothalamus  87. arcuate nucleus of the hypothalamus  88. trigeminal area  89. cerebral blood vessels  89. cerebral blood vessels  89. brain stem  90. brain stem  91. ventral lamina terminalis  92. vagus nerve  93. nucleus of the solitary tract  94. adrenal medulla  95. adrenal cortex  96. locus coeruleus  97. substantia nigra  98. cerebral vessel dilation  99. olfactory bulb  99. odor perception  100. median eminence of hypothalamus  84. reproductive functions  85. modulation of stress, blood pressure  86. metabolism  87. release of pituitary hormones  88. cerebral vessel dilation and blood pressure  90. breathing, heart rate, startle responses, sweating, blood pressure, digestion and body temperature  91. vontral lamina terminalis  91. blood pressure  92. blood pressure  93. blood pressure  94. catecholamine response to stress  95. stress-induced corticosterone release  96. arousal and response to stress  97. substantia nigra  97. control of body movement  98. ventral tegmental area  99. olfactory bulb  100. median eminence of hypothalamus  100. pituitary function  101. raphe nuclei		
hypothalamus  85. magnocellular of the hypothalamus  86. parvocellular neurons of the hypothalamus  87. arcuate nucleus of the hypothalamus  88. trigeminal area  89. cerebral blood vessels  89. cerebral vessel dilation  90. brain stem  91. ventral lamina terminalis  92. vagus nerve  93. nucleus of the solitary tract  94. adrenal medulla  95. adrenal cortex  96. locus coeruleus  97. substantia nigra  98. central tegmental area  89. control of body movement  99. olfactory bulb  100. median eminence of hypothalamus  85. modulation of stress, blood pressure  86. metabolism  87. release of pituitary hormones  88. cerebral vessel dilation and blood pressure  89. cerebral vessel dilation  90. breathing, heart rate, startle responses, sweating, blood pressure, digestion and body temperature  91. ventral lamina terminalis  92. vagus nerve  93. blood pressure and heart rate  94. catecholamine response to stress  95. stress-induced corticosterone release  96. locus coeruleus  96. arousal and response to stress  97. substantia nigra  97. control of body movement  98. ventral tegmental area  98. control of body movement  99. olfactory bulb  100. median eminence of hypothalamus  101. sleep and arousal		84. reproductive functions
85. magnocellular of the hypothalamus  86. parvocellular neurons of the hypothalamus  87. arcuate nucleus of the hypothalamus  88. trigeminal area  89. cerebral vessel dilation and blood pressure  89. cerebral blood vessels  89. cerebral vessel dilation  90. brain stem  90. breathing, heart rate, startle responses, sweating, blood pressure, digestion and body temperature  91. ventral lamina terminalis  92. vagus nerve  93. nucleus of the solitary tract  94. adrenal medulla  95. adrenal cortex  96. locus coeruleus  97. substantia nigra  98. ventral tegmental area  99. olfactory bulb  100. median eminence of hypothalamus  85. modulation of stress, blood pressure  86. metabolism  86. metabolism  87. release of pituitary hormones  88. cerebral vessel dilation and blood pressure  89. cerebral vessel dilation  90. breathing, heart rate, startle responses, sweating, blood pressure, digestion and body temperature  91. ventral lamina terminalis  92. vagus nerve  93. blood pressure  94. catecholamine response to stress  95. stress-induced corticosterone release  96. locus coeruleus  96. arousal and response to stress  97. substantia nigra  97. control of body movement  98. ventral tegmental area  98. control of body movement  99. olfactory bulb  100. pituitary function  101. raphe nuclei		1
and lactation  86. parvocellular neurons of the hypothalamus  87. arcuate nucleus of the hypothalamus  88. trigeminal area  88. cerebral vessel dilation and blood pressure  89. cerebral blood vessels  89. cerebral vessel dilation  90. brain stem  90. breathing, heart rate, startle responses, sweating, blood pressure, digestion and body temperature  91. ventral lamina terminalis  91. blood pressure  92. vagus nerve  93. nucleus of the solitary tract  94. adrenal medulla  94. catecholamine response to stress  95. adrenal cortex  96. locus coeruleus  97. substantia nigra  98. ventral tegmental area  99. olfactory bulb  99. odor perception  100. median eminence of hypothalamus  101. raphe nuclei  101. sleep and arousal		85. modulation of stress, blood pressure
Standard		and lactation
87. arcuate nucleus of the hypothalamus  88. trigeminal area  88. cerebral vessel dilation and blood pressure  89. cerebral blood vessels  89. cerebral vessel dilation  90. brain stem  90. breathing, heart rate, startle responses, sweating, blood pressure, digestion and body temperature  91. ventral lamina terminalis  92. vagus nerve  93. nucleus of the solitary tract  94. adrenal medulla  94. catecholamine response to stress  95. adrenal cortex  96. locus coeruleus  97. substantia nigra  98. ventral tegmental area  99. olfactory bulb  100. median eminence of hypothalamus  101. raphe nuclei  98. cerebral vessel dilation and blood pressure  90. breathing, heart rate, startle responses, sweating, blood pressure, digestion and body temperature  91. blood pressure  92. blood pressure and heart rate  93. blood pressure  94. catecholamine response to stress  95. adrenal cortex  96. arousal and response to stress  97. control of body movement  98. ventral tegmental area  99. odor perception  100. pituitary function  101. sleep and arousal	86. parvocellular neurons of the	86. metabolism
88. trigeminal area  89. cerebral vessel dilation and blood pressure  89. cerebral blood vessels  89. cerebral vessel dilation  90. brain stem  90. breathing, heart rate, startle responses, sweating, blood pressure, digestion and body temperature  91. ventral lamina terminalis  92. vagus nerve  93. nucleus of the solitary tract  94. adrenal medulla  95. adrenal cortex  96. locus coeruleus  97. substantia nigra  98. ventral tegmental area  99. olfactory bulb  99. odor perception  100. median eminence of hypothalamus  101. raphe nuclei  98. verebral vessel dilation and blood pressure  89. cerebral vessel dilation and blood pressure  90. breathing, heart rate, startle responses, sweating, blood pressure, digestion and body temperature  91. blood pressure  92. blood pressure  93. blood pressure  94. catecholamine response to stress  95. stress-induced corticosterone release  96. arousal and response to stress  97. control of body movement  98. ventral tegmental area  98. control of body movement  99. olfactory bulb  100. pituitary function  101. sleep and arousal	hypothalamus	
pressure  89. cerebral blood vessels  89. cerebral vessel dilation  90. brain stem  90. braining, heart rate, startle responses, sweating, blood pressure, digestion and body temperature  91. ventral lamina terminalis  91. blood pressure  92. vagus nerve  93. nucleus of the solitary tract  94. adrenal medulla  94. catecholamine response to stress  95. adrenal cortex  96. locus coeruleus  97. substantia nigra  98. ventral tegmental area  99. olfactory bulb  99. odor perception  100. median eminence of hypothalamus  101. raphe nuclei  101. sleep and arousal	87. arcuate nucleus of the hypothalamus	
89. cerebral blood vessels 90. brain stem 90. brain stem 90. breathing, heart rate, startle responses, sweating, blood pressure, digestion and body temperature 91. ventral lamina terminalis 91. blood pressure 92. vagus nerve 92. blood pressure and heart rate 93. nucleus of the solitary tract 94. adrenal medulla 94. catecholamine response to stress 95. adrenal cortex 96. locus coeruleus 97. substantia nigra 98. ventral tegmental area 99. olfactory bulb 99. odor perception 100. median eminence of hypothalamus 101. raphe nuclei 101. sleep and arousal	88. trigeminal area	88. cerebral vessel dilation and blood
90. brain stem 90. brain stem 90. breathing, heart rate, startle responses, sweating, blood pressure, digestion and body temperature 91. ventral lamina terminalis 91. blood pressure 92. vagus nerve 93. nucleus of the solitary tract 94. adrenal medulla 94. catecholamine response to stress 95. adrenal cortex 96. locus coeruleus 97. substantia nigra 98. ventral tegmental area 99. olfactory bulb 99. odor perception 100. median eminence of hypothalamus 101. raphe nuclei 101. sleep and arousal		
sweating, blood pressure, digestion and body temperature  91. ventral lamina terminalis  92. vagus nerve  93. nucleus of the solitary tract  94. adrenal medulla  95. adrenal cortex  96. locus coeruleus  97. substantia nigra  98. ventral tegmental area  99. olfactory bulb  100. median eminence of hypothalamus  101. raphe nuclei  91. blood pressure  92. blood pressure and heart rate  93. blood pressure  94. catecholamine response to stress  95. stress-induced corticosterone release  96. arousal and response to stress  97. control of body movement  98. control of body movement  99. odor perception  100. pituitary function  101. sleep and arousal	89. cerebral blood vessels	
body temperature  91. ventral lamina terminalis  92. vagus nerve  92. blood pressure and heart rate  93. nucleus of the solitary tract  94. adrenal medulla  95. adrenal cortex  96. locus coeruleus  97. substantia nigra  98. ventral tegmental area  99. olfactory bulb  99. olfactory bulb  100. median eminence of hypothalamus  101. raphe nuclei  91. blood pressure  92. blood pressure and heart rate  93. blood pressure  94. catecholamine response to stress  95. stress-induced corticosterone release  96. arousal and response to stress  97. control of body movement  98. control of body movement  99. olor perception  100. pituitary function  101. sleep and arousal	90. brain stem	1
91. ventral lamina terminalis 92. vagus nerve 93. nucleus of the solitary tract 94. adrenal medulla 95. adrenal cortex 96. locus coeruleus 97. substantia nigra 98. ventral tegmental area 99. olfactory bulb 100. median eminence of hypothalamus 101. raphe nuclei 99. blood pressure 91. blood pressure 92. blood pressure 93. blood pressure 94. catecholamine response to stress 95. stress-induced corticosterone release 96. arousal and response to stress 97. control of body movement 98. control of body movement 99. odor perception 100. pituitary function 101. sleep and arousal		
92. vagus nerve 93. nucleus of the solitary tract 94. adrenal medulla 95. stress-induced corticosterone release 96. locus coeruleus 97. substantia nigra 98. ventral tegmental area 99. olfactory bulb 100. median eminence of hypothalamus 101. raphe nuclei 92. blood pressure and heart rate 93. blood pressure 94. catecholamine response to stress 95. stress-induced corticosterone release 96. arousal and response to stress 97. control of body movement 98. control of body movement 99. olfactory bulb 100. pituitary function 101. sleep and arousal		
93. nucleus of the solitary tract 94. adrenal medulla 95. adrenal cortex 96. locus coeruleus 97. substantia nigra 98. ventral tegmental area 99. olfactory bulb 99. odor perception 100. median eminence of hypothalamus 101. raphe nuclei 93. blood pressure 94. catecholamine response to stress 95. stress-induced corticosterone release 96. arousal and response to stress 97. control of body movement 98. control of body movement 99. odor perception 100. pituitary function 101. sleep and arousal		
94. adrenal medulla 95. adrenal cortex 95. adrenal cortex 96. locus coeruleus 97. substantia nigra 98. ventral tegmental area 99. olfactory bulb 99. odor perception 100. median eminence of hypothalamus 101. raphe nuclei 99. catecholamine response to stress 97. stress-induced corticosterone release 96. arousal and response to stress 97. control of body movement 98. control of body movement 99. odor perception 100. pituitary function 101. sleep and arousal		
95. adrenal cortex95. stress-induced corticosterone release96. locus coeruleus96. arousal and response to stress97. substantia nigra97. control of body movement98. ventral tegmental area98. control of body movement99. olfactory bulb99. odor perception100. median eminence of hypothalamus100. pituitary function101. raphe nuclei101. sleep and arousal		
96. locus coeruleus 97. substantia nigra 98. ventral tegmental area 99. olfactory bulb 100. median eminence of hypothalamus 101. raphe nuclei 99. arousal and response to stress 97. control of body movement 98. control of body movement 99. odor perception 100. pituitary function 101. sleep and arousal		
97. substantia nigra 98. ventral tegmental area 99. olfactory bulb 99. odor perception 100. median eminence of hypothalamus 101. raphe nuclei 97. control of body movement 98. control of body movement 99. odor perception 100. pituitary function 101. sleep and arousal		
98. ventral tegmental area98. control of body movement99. olfactory bulb99. odor perception100. median eminence of hypothalamus100. pituitary function101. raphe nuclei101. sleep and arousal		
99. olfactory bulb99. odor perception100. median eminence of hypothalamus100. pituitary function101. raphe nuclei101. sleep and arousal		
100. median eminence of hypothalamus100. pituitary function101. raphe nuclei101. sleep and arousal		
101. raphe nuclei 101. sleep and arousal		
1 102 habenula 1 1 102 sevual activity 1		
	102. habenula	102. sexual activity
103. cerebellum 103. control of body movement	103. cerebellum	103. control of body movement

104. posterior hypothalamus	104. intestinal motility and blood pressure
105. dorsal medulla	105. blood pressure
106. lateral hypothalamus	106. food intake and stomach acid
	secretion
107. rostral hypothalamus	107. heart rate
108. pontine-medullary reticular formation	108. respiration and heart rate
109. medulla	109. respiration and heart rate
110. mesencephalon	110. heart rate
111. ventral hypothalamus	111. response to stress
112. paraventricular nucleus of	112. response to stress
hypothalamus	-
113. preoptic area of hypothalamus	113. sexual activity
114. mammillary region	114. food intake
115. perifornical area of hypothalamus	115. food intake
116. ventromedial hypothalamus	116. food intake
117. pons/reticular formation	117. arousal and wakefulness
118. septum	118. emotional control
119. pedunculopontine tegmental nucleus	119. arousal
120. astrocytes	120. neuronal metabolism
121. microglia	121. response to neuronal injury
122. choroid plexus	122. production of cerebrospinal fluid
123. Schwann cells	123. myelination of peripheral nerves
124. endoneurium	124. production of connective tissue nerve
	sheath
125. lateral spinothalamic pathway	125. response to pain and temperature
	stimuli
126. ventral spinothalamic pathway	126. touch sensation
127. dorsal column-medial lemniscal	127. touch sensation
pathway	
128. free nerve endings	128. response to pain and temperature
129. hair follicle endings	129. touch sensation
130. Krause's end-bulb	130. temperature sensation
131. Meissner's corpuscles	131. touch-pressure sensation
132. Merkel's disk	132. touch-pressure sensation
133. Pacinian corpuscle	133. touch-pressure sensation
134. Ruffini's corpuscle	134. temperature sensation
135. retina	135. visual acuity
136. parathyroid gland	136. calcium balance
137. placenta	137. placental activity
138. skeletal muscle fibers	138. muscle contraction
139. copora cavernosum	139. genital vasodilation
140. corticospinal tract	140. movement control
141. motor cerebral cortex	141. movement control
142. postganglionic neurons	142. control of blood pressure and adrenal
	activity
143. intramural ganglion	143. distal colon peristalsis
144. hypogastric plexus	144. control of urethral and anal sphincters
145. pelvic plexus	145. genital vasodilatation and penile
	erection

146. vesical plexus	146. urinary bladder control
147. celiac plexus	147. intestinal peristolisis
Location:	Correlated Physiological Function:
116. ventromedial hypothalamus	116. food intake

- subjecting said receptor to constitutive receptor activation to establish a non-endogenous constitutively activated G protein coupled cell surface receptor;
- (d) contacting a non-endogenous candidate compound with said non-endogenous constitutively activated G protein coupled cell surface receptor of step (c);
- (e) determining, by measurement of the compound efficacy at said contacted receptor, whether said non-endogenous candidate compound has inverse agonist activity or agonist activity to said receptor of step (c); and
- (f) directly identifying a non-endogenous candidate compound of step (e) having inverse agonist activity as an inverse agonist to said receptor of step (c), or having agonist activity as an agonist to said receptor of step (c);
- (g) selecting an inverse agonist to reduce a selected physiological function of step (b) correlated with the tissue-expression location for said receptor of step (a), or selecting an agonist to enhance a selected physiological function of step (b) correlated with the tissue-expression location for said receptor of step (a); and
- (h) contacting said inverse agonist with a mammal comprising said receptor of step (a) and confirming that said inverse agonist reduces said selected physiological function, or contacting said agonist with a mammal comprising said receptor of step (a) and confirming that said agonist enhances said selected physiological function

wherein said directly identified non-endogenous candidate compound of step (f) was not, prior to such direct identification, indirectly identified as an agonist or antagonist to said endogenous G protein coupled cell surface receptor.

Claim 39 (Amended Four Times) A method for directly identifying a non-endogenous candidate compound as a compound having activity selected from the group consisting of inverse agonist activity and agonist activity to an endogenous constitutively activated G protein coupled cell surface receptor, wherein a location of expression of said receptor has been identified from a mammalian tissue source and has been correlated with at least one physiological function in a mammal, comprising the steps of:

- (a) selecting an endogenous constitutively activated G protein coupled cell surface receptor, wherein the ligand for said receptor has not been identified;
- (b) determining the location of expression of said receptor in a mammalian tissue source and correlating the expression location of said receptor with at least one mammalian physiological function of interest, wherein said location and said correlated physiological function are selected from group consisting essentially of:

Location:	Correlated Physiological Function:
gastrointestinal tract     smooth muscle	1. motility of stomach and intestines
2. gastrointestinal tract	2. motility of stomach and intestines
ganglionic nerve fibers	
3. urinary tract smooth muscle	3. ureter function and urinary bladder function
4. salivary gland	4. salivary secretion
5. alpha cells of the pancreas	5. secretion of glucagon
6. beta cells of the pancreas	6. secretion of insulin
7. uterine smooth muscle	7. uterine contraction
8. heart muscle	8. contractility of heart muscle
9. vascular smooth muscle	9. contractility of smooth muscle
10. adipocytes	10. lipolysis
11. platelets	11. platelet aggregation in response to blood vessel injury
12. skeletal neuromuscular junction	12. skeletal muscle contractility
13. bronchial smooth muscle	13. respiration
14. nasal mucosal blood vessels	14. mucosa volume
15. trigone muscle of bladder and urethra	15. urinary outflow
16. chondrocytes	16. cartilage formation
17. ciliary body of the eye	17. aqueous humor production
18. thyroid	18. thyroid hormone secretion
19. mast cells	19. immediate hypersensitivity reactions
20. basophils	20. immediate hypersensitivity reactions
21. osteoblasts	21. bone remodeling
22. osteoclasts	22. bone remodeling
23. brain capillary endothelial cells	23. permeability of blood-brain barrier
24. T cells	24. immune response
25. B cells	25. immune response
26. kidney proximal tubular epithelial cells	26. organic acids exchange
27. neutrophils	27. immune response
28. eosinophils	28. immune response
29. monocytes	29. immune response
30. kidney late distal tubule	30. organic bases exchange
31. collecting duct principal cells	31. organic bases exchange
32. kidney granular juxtaglomerular cells	32. secretion of renin
33. peripheral postganglionic adrenergic	33. sympathetic function
neurons	
34. hepatocytes	34. synthesis of cholesterol and lipoprotein
35. gastrointestinal parietal cells	35. secretion of stomach acid
36. gastrointestinal superficial epithelial	36. secretion of cytoprotective factors,
cells	mucus and bicarbonate
37. epidermal cells	37. skin maintenance
38. bone marrow stem cells	38. erythropoesis production
39. angle structures of the eye	39. aqueous humor outflow
40. uveoscleral structures of eye	40. aqueous humor outflow
To. uvcosciciai suuciuies oi eye	1 10. aqueous humor outnow

41. suprachiasmatic nucleus 42. baroreceptors 43. basal ganglia 43. basal ganglia 44. periaqueductal grey and dorsal hom of spinal cord 45. area postrema 46. thalarnus 46. sensorimotor processing and arousal 47. sensorimotor cerebral cortex 47. sensorimotor processing 48. spinal cord motor neurons 48. spinal cord motor neurons 49. dorsal root ganglion neurons 49. dorsal root ganglion neurons 50. oligodendrocytes 50. nucleus basalis 51. nucleus basalis 52. nucleus accumbens 53. lateral reticular formation of medulla 54. hypothalamic neurons containing growth hormone releasing factor (GHRH) 55. hypothalamic neurons containing somatostatin 56. hypothalamic neurons containing ghyrotropin-releasing hormone (TRH) 57. hypothalamic neurons containing gomadoropin releasing factor (GRF) 59. anterior pituitary somatotropes 60. anterior pituitary somatotropes 61. anterior pituitary gonadotropes 62. anterior pituitary gonadotropes 63. anterior pituitary gonadotropes 64. leydig cells of the testes 65. serotio cells of the testes 66. granulosa cells of the cvary 67. theca cells of the ovary 68. synovium 69. amygdala 70. pineal gland 71. nucleus of the solitary tract 72. caudal ventrolateral medulla 73. rostral ventrolateral medulla 74. parabrachial nucleus 75. enorthinal cortex 76. pyriform cortex 77. temporal cortex 78. frontal cortex 79. parietal cortex 79. priorietal cortex 79. visual acuity, touch perception, and	<del></del>	
42. basoreceptors 43. basal ganglia 44. periaqueductal grey and dorsal horn of spinal cord 45. area postrema 46. thalamus 46. sensorimotor processing and arousal 47. sensorimotor cerebral cortex 48. spinal cord motor neurons 49. dorsal root ganglion neurons 50. oligodendrocytes 51. nucleus basalis 52. nucleus accumbens 53. lateral reticular formation of medulla 54. hypothalamic neurons containing growth hormone releasing factor (GHRH) 55. hypothalamic neurons containing somatostatin 56. hypothalamic neurons containing somatostatin 57. hypothalamic neurons containing somatostatin 58. hypothalamic neurons containing somatoropin releasing hormone (GRRH) 59. anterior pituitary somatotropes 60. anterior pituitary gonadotropes 61. anterior pituitary gonadotropes 62. anterior pituitary gonadotropes 63. anterior pituitary gonadotropes 64. leydig cells of the testes 65. sertoli cells of the testes 66. granulosa cells of the ovary 67. theca cells of the ovary 68. synovium 69. amygdala 70. pineal gland 70. regulation of emotion 71. nucleus of the solitary tract 72. caudal ventrolateral medulla 73. rostral requiation 74. temporal cortex 75. fentral requisition 76. pyriform cortex 77. temporal cortex 78. frontal cortex 78. frontal cortex 78. frontal cortex 78. frontal cortes 78. frontal cortex	41. suprachiasmatic nucleus	41. circadian rhythm
43. basal ganglia 44. periaqueductal grey and dorsal hom of spinal cord 45. area postrema 46. thalamus 46. thalamus 47. sensorimotor cerebral cortex 48. spinal cord motor neurons 48. motor function control 49. dorsal root ganglion neurons 49. dorsal root ganglion neurons 50. oligodendrocytes 51. nucleus basalis 51. cognition and memory 52. nucleus accumbens 53. lateral reticular formation of medulla 54. hypothalamic neurons containing growth hormone releasing factor (GHRH) 55. hypothalamic neurons containing somatostatin 56. hypothalamic neurons containing gomatoropin-releasing hormone (TRH) 57. hypothalamic neurons containing gonadotropin releasing hormone (GnRH) 58. hypothalamic neurons containing gonadotropin releasing factor (CFF) 59. anterior pituitary somatotropes 60. anterior pituitary gonadotropes 61. anterior pituitary gonadotropes 62. anterior pituitary gonadotropes 63. anterior pituitary corticotropes 64. leydig cells of the testes 65. sertoli cells of the testes 66. granulosa cells of the ovary 67. theca cells of the ovary 68. synovium 69. amygdala 70. pineal gland 71. nucleus of the solitary tract 72. caudal ventrolateral medulla 73. rostral ventrolateral medulla 74. taste aversion of enotional response and nemory acquisition 75. frontal cortex 76. pypriform cortex 77. temporal cortex 78. frontal cortex 79. frontal cortex 79. frontal cortex 79. frontal cortex 70. frontal cortex 70. frontal cortex 70. frontal cortex 71. frontal cortex 72. cardiovascular regulation 73. rostral cortex 74. taste aversion of emotional response and necess		
44. periaqueductal grey and dorsal hom of spinal cord 45. area postrema 46. thalamus 47. sensorimotor processing and arousal 47. sensorimotor processing and arousal 47. sensorimotor processing and arousal 47. sensorimotor processing 48. spinal cord motor neurons 48. spinal cord motor neurons 49. dorsal root ganglion neurons 50. oligodendrocytes 50. neuron myelin sheath production 51. nucleus basalis 52. nucleus accumbens 53. lateral reticular formation of medulla 54. hypothalamic neurons containing growth hormone releasing factor (GHRH) 55. hypothalamic neurons containing somatostatin 56. hypothalamic neurons containing thyrotropin-releasing hormone (TRH) 57. hypothalamic neurons containing gonadotropin releasing hormone (GnRH) 58. hypothalamic neurons containing corticotropin releasing factor (CRF) 59. anterior pituitary smatotropes 60. anterior pituitary gonadotropes 61. anterior pituitary gonadotropes 62. anterior pituitary gonadotropes 63. anterior pituitary gonadotropes 64. leydig cells of the testes 65. sertoli cells of the testes 66. granulosa cells of the tovary 67. specifion of eatogen 68. synovium 69. amygdala 70. pineal gland 70. pineal gland 71. nucleus of the solitary tract 72. caudal ventrolateral medulla 73. rostral reduction 74. temporal cortex 75. entorhinal cortex 76. pypriform cortex 77. temporal cortex 78. frontal cortes 78. frontal cortex 78. frontal cortes 78. frontal cortex 78. frontal cortes 78. frontal cortex		43. movement control
spinal cord   45. area postrema   45. vomiting   46. sensorimotor cerebral cortex   47. sensorimotor processing and arousal   48. spinal cord motor neurons   48. motor function control   49. dorsal root ganglion neurons   49. sensory information transmission   50. oligodendrocytes   50. neuron myelin sheath production   51. nucleus basalis   51. cognition and memory   52. nucleus accumbens   53. lateral reticular formation of medulla   53. vomiting   54. hypothalamic neurons containing growth hormone releasing factor (GHRH)   55. hypothalamic neurons containing somatostatin   56. hypothalamic neurons containing thyrotropin-releasing hormone (TRH)   57. hypothalamic neurons containing gonadotropin releasing hormone (GnRH)   58. hypothalamic neurons containing corticotropin releasing factor (CRF)   59. anterior pituitary somatotropes   59. secretion of GnRH   58. secretion of prolactin   56. anterior pituitary gonadotropes   61. secretion of prolactin   62. anterior pituitary gonadotropes   63. anterior pituitary gonadotropes   64. secretion of prolactin   65. secretion of fulcinizing hormone   66. sertoli cells of the testes   66. sertoli cells of the testes   66. sertoli cells of the testes   66. sertoli cells of the ovary   66. synthesis of estrogen   67. synthesis of estrogen   68. synovium   69. amygdala   69. modulation of emotion   70. regulation of circadian rhythm   71. nucleus of the solitary tract   71. cardiovascular regulation   73. rostral ventrolateral medulla   73. vasopressor activity   74. taste aversion response and nociceptive response   75. cognition   77. temporal cortex   75. cognition   77. temporal cortex   75. cognition   77. temporal cortex   78. frontal cortex   79. frontal cortex   79. frontal cortex   79. frontal		44. nociception
45. area postrema 46. thalamus 46. sensorimotor cerebral cortex 47. sensorimotor processing and arousal 47. sensorimotor processing 48. spinal cord motor neurons 48. motor function control 49. dorsal root ganglion neurons 50. oligodendrocytes 51. nucleus basalis 51. cognition and memory 52. nucleus accumbens 53. lateral reticular formation of medulla 54. hypothalamic neurons containing growth hormone releasing factor (GHRH) 55. hypothalamic neurons containing thyrotropin-releasing hormone (TRH) 56. hypothalamic neurons containing thyrotropin-releasing hormone (TRH) 57. hypothalamic neurons containing gonadotropin releasing factor (CCF) 59. anterior pituitary somatotropes 60. anterior pituitary somatotropes 61. anterior pituitary gonadotropes 62. anterior pituitary gonadotropes 63. anterior pituitary gonadotropes 64. leydig cells of the testes 65. sercetion of the testes 65. sercetion of the testes 66. granulosa cells of the ovary 67. theca cells of the ovary 68. synovium 69. amygdala 70. pineal gland 70. pineal gland 71. nucleus of the solitary tract 72. caudal ventrolateral medulla 73. rostral ventrolateral medulla 74. taste aversion emotoral response and memory acquisition 75. regretion of emotional response and memory acquisition 76. pyriform cortex 77. temporal cortex 78. frontal cortex 79. microsimator processing and arousal arousal arousal arousal arousal area gualation 79. great arousal a	1	
46. thalamus 47. sensorimotor cerebral cortex 48. spinal cord motor neurons 48. spinal cord motor neurons 49. dorsal root ganglion neurons 50. oligodendrocytes 51. nucleus basalis 52. nucleus accumbens 52. nucleus accumbens 53. lateral reticular formation of medulla 54. hypothalamic neurons containing growth hormone releasing factor (GHRH) 55. hypothalamic neurons containing somatostatin 56. hypothalamic neurons containing thyrotropin-releasing hormone (TRH) 57. hypothalamic neurons containing gonadotropin releasing hormone (GNRH) 58. hypothalamic neurons containing gonadotropin releasing hormone (GNRH) 59. anterior pituitary somatotropes 60. anterior pituitary gonadotropes 61. anterior pituitary gonadotropes 62. anterior pituitary gonadotropes 63. anterior pituitary gonadotropes 64. leydig cells of the testes 65. sertoli cells of the testes 66. granulosa cells of the ovary 67. theca cells of the soltary tract 69. amygdala 70. pineal gland 71. nucleus of the solitary tract 72. caudal ventrolateral medulla 73. rostral ventrolateral medulla 74. garabrachial nucleus 75. egnition 76. egnition of emotional response and memory acquisition 77. temporal cortex 78. frontal cortex 79. gensory information of medula or sensory information transmission 49. sensory information transmission 49. sensory information of memory acquisition 49. sensory information transmission 50. neuron myelia head and memory acquisition 77. temporal cortex 78. frontal cortex 78. frontal cortex 79. temporal cortex 78. frontal cortex 79. temporal cortex 79. temporal cortex 70. temporal cortex 70. temporal cortex 71. temporal cortex 72. cardiovascular regulation 73. respulation of emotional response and memory acquisition		45. vomiting
48. spinal cord motor neurons 49. dorsal root ganglion neurons 50. oligodendrocytes 50. neuron myelin sheath production 51. nucleus basalis 51. cognition and memory 52. nucleus accumbens 53. lateral reticular formation of medulla 54. hypothalamic neurons containing growth hormone releasing factor (GHRH) 55. hypothalamic neurons containing somatostatin 56. hypothalamic neurons containing thyrotropin-releasing hormone (TRH) 57. hypothalamic neurons containing gonadotropin releasing hormone (TRH) 58. hypothalamic neurons containing gonadotropin releasing hormone (GnRH) 59. anterior pituitary somatotropes 60. anterior pituitary somatotropes 61. anterior pituitary gonadotropes 62. anterior pituitary gonadotropes 63. anterior pituitary gonadotropes 64. leydig cells of the testes 65. serretion of testosterone 65. serretion of dadrenocorticotropic hormone 66. granulosa cells of the ovary 67. theca cells of the ovary 68. synovium 69. amygdala 70. pineal gland 71. nucleus of the solitary tract 71. cardiovascular regulation 72. caudal ventrolateral medulla 73. rostral ventrolateral medulla 74. parabrachial nucleus 75. entorhinal cortex 76. pyriform cortex 77. temporal cortex 78. frontal cortex 79. cardiovasculation 70. medicaterial medula memory acquisition		46. sensorimotor processing and arousal
48. spinal cord motor neurons 49. dorsal root ganglion neurons 50. oligodendrocytes 50. neuron myelin sheath production 51. nucleus basalis 51. cognition and memory 52. nucleus accumbens 53. lateral reticular formation of medulla 54. hypothalamic neurons containing growth hormone releasing factor (GHRH) 55. hypothalamic neurons containing somatostatin 56. hypothalamic neurons containing thyrotropin-releasing hormone (TRH) 57. hypothalamic neurons containing gonadotropin releasing hormone (TRH) 58. hypothalamic neurons containing gonadotropin releasing hormone (GnRH) 59. anterior pituitary somatotropes 60. anterior pituitary somatotropes 61. anterior pituitary gonadotropes 62. anterior pituitary gonadotropes 63. anterior pituitary gonadotropes 64. leydig cells of the testes 65. serretion of testosterone 65. serretion of dadrenocorticotropic hormone 66. granulosa cells of the ovary 67. theca cells of the ovary 68. synovium 69. amygdala 70. pineal gland 71. nucleus of the solitary tract 71. cardiovascular regulation 72. caudal ventrolateral medulla 73. rostral ventrolateral medulla 74. parabrachial nucleus 75. entorhinal cortex 76. pyriform cortex 77. temporal cortex 78. frontal cortex 79. cardiovasculation 70. medicaterial medula memory acquisition	47. sensorimotor cerebral cortex	47. sensorimotor processing
50. oligodendrocytes   50. neuron myelin sheath production		48. motor function control
50. oligodendrocytes   50. neuron myelin sheath production   51. nucleus basalis   51. cognition and memory   52. nucleus accumbens   52. addictive cravings   53. lateral reticular formation of medulla   53. vomiting   54. hypothalamic neurons containing growth hormone releasing factor (GHRH)   55. hypothalamic neurons containing somatostatin   56. hypothalamic neurons containing thyrotropin-releasing hormone (TRH)   57. hypothalamic neurons containing gonadotropin releasing hormone (GnRH)   58. hypothalamic neurons containing corticotropin releasing factor (CRF)   59. anterior pituitary somatotropes   59. secretion of Grath   57. secretion of CRF   59. anterior pituitary decorrection   59. secretion of prolactin   60. anterior pituitary gonadotropes   61. secretion of prolactin   61. anterior pituitary gonadotropes   62. anterior pituitary gonadotropes   63. secretion of follicle stimulating hormone   64. leydig cells of the testes   64. secretion of testosterone   65. sertoli cells of the testes   65. spermatogenesis   66. granulosa cells of the ovary   66. synthesis of estrogen   67. synthesis of estrogen   68. synovium   68. joint function   69. amygdala   69. modulation of emotion   70. pineal gland   70. regulation of circadian rhythm   71. nucleus of the solitary tract   71. cardiovascular regulation   72. cardiovascular regulation   73. rostral ventrolateral medulla   73. vasopressor activity   74. taste aversion response and nociceptive response   75. entorhinal cortex   76. cognition   77. temporal cortex   77. temporal cortex   77. memory acquisition   78. regulation of emotional response and memory acquisition   78. regulation   78. regulation of emotional response and memory acquisition   78. regulation   78. regu	49. dorsal root ganglion neurons	49. sensory information transmission
51. nucleus basalis 52. nucleus accumbens 53. lateral reticular formation of medulla 54. hypothalamic neurons containing growth hormone releasing factor (GHRH) 55. hypothalamic neurons containing somatostatin 56. hypothalamic neurons containing thyrotropin-releasing hormone (TRH) 57. hypothalamic neurons containing gonadotropin releasing hormone (GRRH) 58. hypothalamic neurons containing gonadotropin releasing factor (CRF) 59. anterior pituitary somatotropes 60. anterior pituitary somatotropes 61. anterior pituitary gonadotropes 62. anterior pituitary gonadotropes 63. anterior pituitary corticotropes 64. leydig cells of the testes 65. serrotion of luteinizing hormone 66. serrotion of luteinizing hormone 67. theca cells of the testes 66. granulosa cells of the ovary 67. theca cells of the ovary 68. synovium 69. amygdala 70. pineal gland 71. nucleus of the solitary tract 72. caudal ventrolateral medulla 73. rostral ventrolateral medulla 74. parabrachial nucleus 75. cognition 76. serotion of medulla response and memory acquisition 77. temporal cortex 78. frontal cortex 79. cardiovascular response and memory acquisition		50. neuron myelin sheath production
52. nucleus accumbens   53. lateral reticular formation of medulla   53. vomiting   54. secretion of GHRH   55. hypothalamic neurons containing growth hormone releasing factor (GHRH)   55. hypothalamic neurons containing somatostatin   56. hypothalamic neurons containing thyrotropin-releasing hormone (TRH)   57. hypothalamic neurons containing gonadotropin releasing hormone (GnRH)   58. hypothalamic neurons containing conticotropin releasing factor (CRF)   59. anterior pituitary somatotropes   60. anterior pituitary somatotropes   61. anterior pituitary gonadotropes   62. anterior pituitary gonadotropes   63. secretion of prolactin   64. leydig cells of the testes   65. sertoli cells of the testes   65. sertoli cells of the testes   66. granulosa cells of the ovary   66. synthesis of estrogen   67. theca cells of the ovary   67. theca cells of the solitary tract   70. pineal gland   71. nucleus of the solitary tract   72. caudal ventrolateral medulla   73. rostral ventrolateral medulla   73. rostral ventrolateral medulla   74. taste aversion response and neciceptive response   75. entorhinal cortex   76. cognition   77. memory acquisition   78. frontal cortex   78. frontal c		
53. lateral reticular formation of medulla   53. vomiting   54. secretion of GHRH   55. hypothalamic neurons containing somatostatin   55. hypothalamic neurons containing thyrotropin-releasing hormone (TRH)   57. hypothalamic neurons containing gonadotropin releasing hormone (GnRH)   58. hypothalamic neurons containing gonadotropin releasing hormone (GnRH)   58. hypothalamic neurons containing corticotropin releasing factor (CRF)   59. anterior pituitary somatotropes   59. secretion of growth hormone   60. anterior pituitary dendotropes   61. anterior pituitary gonadotropes   62. anterior pituitary gonadotropes   63. secretion of fulteinizing hormone   64. leydig cells of the testes   64. secretion of testosterone   65. sertoli cells of the testes   66. granulosa cells of the ovary   66. synthesis of estrogen   67. theca cells of the ovary   68. synovium   68. joint function   69. amygdala   69. modulation of emotion   70. pineal gland   71. nucleus of the solitary tract   71. cardiovascular regulation   72. cardia ventrolateral medulla   73. rostral ventrolateral medulla   74. parabrachial nucleus   75. cognition   76. cognition   76. pyriform cortex   76. pyriform cortex   77. temporal cortex   77. temporal cortex   78. frontal cortex   79. fron	52. nucleus accumbens	
54. hypothalamic neurons containing growth hormone releasing factor (GHRH)   55. hypothalamic neurons containing somatostatin   56. hypothalamic neurons containing thyrotropin-releasing hormone (TRH)   57. hypothalamic neurons containing gonadotropin releasing hormone (GnRH)   58. hypothalamic neurons containing corticotropin releasing factor (CRF)   59. anterior pituitary somatotropes   60. anterior pituitary gonadotropes   61. secretion of prolactin   61. secretion of prolactin   62. anterior pituitary gonadotropes   63. anterior pituitary gonadotropes   63. secretion of luteinizing hormone   64. leydig cells of the testes   64. secretion of testosterone   65. sertoli cells of the testes   65. spermatogenesis   66. granulosa cells of the ovary   67. synthesis of estrogen   69. amygdala   69. modulation of emotion   70. pineal gland   70. regulation of circadian rhythm   71. nucleus of the solitary tract   72. caudal ventrolateral medulla   73. rostral ventrolateral medulla   74. parabrachial nucleus   75. cognition   76. cognition   77. temporal cortex   76. pyriform cortex   77. temporal cortex   77. temporal cortex   78. frontal cortex   79. frontal cortex   79		
growth hormone releasing factor (GHRH)  55. hypothalamic neurons containing somatostatin  56. hypothalamic neurons containing thyrotropin-releasing hormone (TRH)  57. hypothalamic neurons containing gonadotropin releasing hormone (GnRH)  58. hypothalamic neurons containing corticotropin releasing factor (CRF)  59. anterior pituitary somatotropes  60. anterior pituitary somatotropes  61. anterior pituitary gonadotropes  62. anterior pituitary gonadotropes  63. anterior pituitary corticotropes  64. leydig cells of the testes  65. secretion of CRF  66. granulosa cells of the testes  66. granulosa cells of the ovary  67. theca cells of the ovary  68. synovium  69. amygdala  70. pineal gland  71. nucleus of the solitary tract  72. caudal ventrolateral medulla  73. vasopressor activity  74. taste aversion response and nociceptive response  75. entorhinal cortex  76. pyriform cortex  77. temporal cortex  77. temporal cortex  78. frontal cortex		
55. hypothalamic neurons containing somatostatin		
somatostatin  56. hypothalamic neurons containing thyrotropin-releasing hormone (TRH)  57. hypothalamic neurons containing gonadotropin releasing hormone (GnRH)  58. hypothalamic neurons containing corticotropin releasing factor (CRF)  59. anterior pituitary somatotropes  60. anterior pituitary lactotropes  61. anterior pituitary gonadotropes  62. anterior pituitary gonadotropes  63. secretion of prolactin hormone  64. leydig cells of the testes  65. sertoli cells of the testes  66. granulosa cells of the ovary  67. theca cells of the ovary  68. synovium  69. amygdala  70. pineal gland  71. nucleus of the solitary tract  72. caudal ventrolateral medulla  73. rostral ventrolateral medulla  74. parabrachial nucleus  75. entorhinal cortex  76. pyriform cortex  77. temporal cortex  77. temporal cortex  78. frontal cortex  77. temporal cortex  78. frontal cortex  76. possible of traction of containing to first production of the production of the production of production of production of production of follicle stimulating hormone  66. secretion of follicle stimulating hormone  67. secretion of follicle stimulating hormone  68. secretion of adrenocorticotropic hormone  69. secretion of testosterone  65. secretion of adrenocorticotropic hormone  66. synthesis of estrogen  67. synthesis of estrogen  68. joint function  79. regulation of emotion  70. regulation of circadian rhythm  71. cardiovascular regulation  72. cardiovascular regulation  73. vasopressor activity  74. taste aversion response and nociceptive response  75. entorhinal cortex  76. cognition  77. temporal cortex  77. memory acquisition		55. secretion of somatostatin
thyrotropin-releasing hormone (TRH)  57. hypothalamic neurons containing gonadotropin releasing hormone (GnRH)  58. hypothalamic neurons containing corticotropin releasing factor (CRF)  59. anterior pituitary somatotropes  60. anterior pituitary lactotropes  61. anterior pituitary gonadotropes  62. anterior pituitary gonadotropes  63. anterior pituitary corticotropes  64. leydig cells of the testes  65. sertoli cells of the testes  66. granulosa cells of the ovary  67. theca cells of the ovary  68. synovium  69. amygdala  70. pineal gland  71. nucleus of the solitary tract  72. caudal ventrolateral medulla  73. rostral ventrolateral medulla  74. parabrachial nucleus  75. entorhinal cortex  76. pyriform cortex  77. temporal cortex  78. frontal cortex  78. frontal cortex  78. frontal cortex  78. regulation of emotional response and memory acquisition  78. regulation of emotional response and memory acquisition	- 1	·
thyrotropin-releasing hormone (TRH)  57. hypothalamic neurons containing gonadotropin releasing hormone (GnRH)  58. hypothalamic neurons containing corticotropin releasing factor (CRF)  59. anterior pituitary somatotropes  60. anterior pituitary lactotropes  61. anterior pituitary gonadotropes  62. anterior pituitary gonadotropes  63. anterior pituitary corticotropes  64. leydig cells of the testes  65. sertoli cells of the testes  66. granulosa cells of the ovary  67. theca cells of the ovary  68. synovium  69. amygdala  70. pineal gland  71. nucleus of the solitary tract  72. caudal ventrolateral medulla  73. rostral ventrolateral medulla  74. parabrachial nucleus  75. entorhinal cortex  76. pyriform cortex  77. temporal cortex  78. frontal cortex  78. frontal cortex  78. frontal cortex  78. frontal cortex  78. regulation of emotional response and memory acquisition	56. hypothalamic neurons containing	56. secretion of TRH
57. hypothalamic neurons containing gonadotropin releasing hormone (GnRH)   58. hypothalamic neurons containing corticotropin releasing factor (CRF)   59. anterior pituitary somatotropes   60. secretion of growth hormone   60. anterior pituitary gonadotropes   61. anterior pituitary gonadotropes   62. secretion of luteinizing hormone   63. anterior pituitary corticotropes   63. secretion of follicle stimulating hormone   64. leydig cells of the testes   64. secretion of testosterone   65. sertoli cells of the testes   65. spermatogenesis   66. granulosa cells of the ovary   67. theca cells of the ovary   67. synthesis of estrogen   68. synovium   68. joint function   69. amygdala   69. modulation of emotion   70. pineal gland   70. regulation of circadian rhythm   71. nucleus of the solitary tract   72. caudal ventrolateral medulla   73. rostral ventrolateral medulla   73. rostral ventrolateral medulla   74. taste aversion response and nociceptive response   75. cognition   76. pyriform cortex   76. pyriform cortex   77. temporal cortex   78. frontal cortex   78		
gonadotropin releasing hormone (GnRH)  58. hypothalamic neurons containing corticotropin releasing factor (CRF)  59. anterior pituitary somatotropes  60. anterior pituitary lactotropes  61. anterior pituitary gonadotropes  62. anterior pituitary gonadotropes  63. anterior pituitary corticotropes  64. leydig cells of the testes  65. sertoli cells of the testes  66. granulosa cells of the ovary  67. theca cells of the ovary  68. synovium  69. amygdala  70. pineal gland  71. nucleus of the solitary tract  72. caudal ventrolateral medulla  73. rostral ventrolateral medulla  74. parabrachial nucleus  75. entorhinal cortex  76. pyriform cortex  77. temporal cortex  78. frontal cortex  78. frontal cortex  78. frontal cortex  78. regulation of emotion in province and memory acquisition  59. secretion of prolactin  60. secretion of prolactin  61. secretion of follicle stimulating hormone  62. secretion of of adrenocorticotropic hormone  63. secretion of destosterone  64. secretion of destosterone  65. spermatogenesis  66. synthesis of estrogen  67. synthesis of estrogen  68. joint function  69. modulation of emotion  70. regulation of circadian rhythm  71. cardiovascular regulation  72. cardiovascular regulation  73. vasopressor activity  74. taste aversion response and nociceptive response  75. cognition  76. pyriform cortex  77. memory acquisition		57. secretion of GnRH
58. hypothalamic neurons containing conticotropin releasing factor (CRF)  59. anterior pituitary somatotropes  60. anterior pituitary gonadotropes  61. anterior pituitary gonadotropes  62. anterior pituitary gonadotropes  63. anterior pituitary corticotropes  64. leydig cells of the testes  65. sertoli cells of the testes  66. granulosa cells of the ovary  67. theca cells of the ovary  68. synovium  69. amygdala  70. pineal gland  71. nucleus of the solitary tract  72. caudal ventrolateral medulla  73. rostral ventrolateral medulla  74. taste aversion response and nociceptive response  75. entorhinal cortex  76. pyriform cortex  77. temporal cortex  78. frontal cortex  78. frontal cortex  78. regulation of emotional response and memory acquisition	_	
59. anterior pituitary somatotropes   60. anterior pituitary lactotropes   60. secretion of prolactin		58. secretion of CRF
60. anterior pituitary lactotropes 61. anterior pituitary gonadotropes 62. anterior pituitary gonadotropes 63. anterior pituitary corticotropes 64. leydig cells of the testes 65. sertoli cells of the testes 66. granulosa cells of the ovary 67. theca cells of the ovary 68. synovium 69. amygdala 70. pineal gland 71. nucleus of the solitary tract 72. caudal ventrolateral medulla 73. rostral ventrolateral medulla 74. parabrachial nucleus 75. entorhinal cortex 76. pyriform cortex 77. temporal cortex 78. frontal cortex 78. frontal cortex 78. frontal cortex 76. pyriform cortex 77. regulation of prolactin 61. secretion of prolactin 62. secretion of luteinizing hormone 62. secretion of follicle stimulating hormone 62. secretion of follicle stimulating hormone 62. secretion of follicle stimulating hormone 62. secretion of prolactin 62. secretion of prolactin 62. secretion of prolactin 62. secretion of luteinizing hormone 63. secretion of adrenocorticotropic hormone 64. leydig cells of the estes 65. spermatogenesis 66. synthesis of estrogen 67. synthesis of estrogen 68. joint function 69. modulation of emotion 70. regulation of circadian rhythm 71. cardiovascular regulation 72. cardiovascular regulation 73. vasopressor activity 74. taste aversion response and nociceptive response 75. cognition 76. cognition 77. temporal cortex 77. memory acquisition 78. frontal cortex 78. regulation of emotional response and memory acquisition	corticotropin releasing factor (CRF)	
61. anterior pituitary gonadotropes 62. anterior pituitary gonadotropes 63. anterior pituitary corticotropes 64. leydig cells of the testes 65. sertoli cells of the testes 66. granulosa cells of the ovary 67. theca cells of the ovary 68. synovium 69. amygdala 70. pineal gland 71. nucleus of the solitary tract 72. caudal ventrolateral medulla 73. rostral ventrolateral medulla 74. parabrachial nucleus 75. entorhinal cortex 76. cognition 77. temporal cortex 77. temporal cortex 78. frontal cortex 78. regulation of follicle stimulating hormone 62. secretion of follicle stimulating hormone 63. secretion of adrenocorticotropic hormone 64. leydig cells of the testes 65. secretion of adrenocorticotropic hormone 66. synthesis of estrogen 67. synthesis of estrogen 68. synthesis of estrogen 68. joint function 69. modulation of emotion 70. regulation of circadian rhythm 71. cardiovascular regulation 72. cardiovascular regulation 73. vasopressor activity 74. taste aversion response and nociceptive response 75. cognition 76. cognition 77. memory acquisition		
62. anterior pituitary gonadotropes 63. anterior pituitary corticotropes 64. leydig cells of the testes 65. sertoli cells of the testes 66. granulosa cells of the ovary 67. theca cells of the ovary 68. synovium 69. amygdala 70. pineal gland 71. nucleus of the solitary tract 72. caudal ventrolateral medulla 73. rostral ventrolateral medulla 74. parabrachial nucleus 75. entorhinal cortex 76. pyriform cortex 77. temporal cortex 78. frontal cortex 78. frontal cortex 78. frontal cortex 76. assertion of follicle stimulating hormone 62. secretion of adrenocorticotropic hormone 63. secretion of adrenocorticotropic hormone 64. leydig cells of the testes 65. secretion of adrenocorticotropic hormone 64. secretion of extension of testosterone 65. sertoli cells of the testes 66. synthesis of estrogen 67. synthesis of estrogen 68. joint function 69. modulation of emotion 70. regulation of circadian rhythm 71. cardiovascular regulation 72. cardiovascular regulation 73. vasopressor activity 74. taste aversion response and nociceptive response 75. cognition 76. cognition 77. temporal cortex 77. memory acquisition 78. regulation of emotional response and memory acquisition	60. anterior pituitary lactotropes	
hormone  63. anterior pituitary corticotropes  64. leydig cells of the testes  65. sertoli cells of the testes  66. granulosa cells of the ovary  67. theca cells of the ovary  68. synovium  69. amygdala  70. pineal gland  71. nucleus of the solitary tract  72. caudal ventrolateral medulla  73. rostral ventrolateral medulla  74. parabrachial nucleus  75. entorhinal cortex  76. cyniform cortex  77. temporal cortex  78. frontal cortex  78. frontal cortex  78. frontal cortex  78. frontal cortex  64. secretion of adrenocorticotropic hormon  64. secretion of testosterone  65. spermatogenesis  66. synthesis of estrogen  67. synthesis of estrogen  68. joint function  69. modulation of emotion  70. regulation of circadian rhythm  71. cardiovascular regulation  72. cardiovascular regulation  73. vasopressor activity  74. taste aversion response and nociceptive response  75. cognition  76. cognition  77. memory acquisition  78. regulation of emotional response and memory acquisition	61. anterior pituitary gonadotropes	61. secretion of luteinizing hormone
63. anterior pituitary corticotropes  64. leydig cells of the testes  65. sertoli cells of the testes  66. granulosa cells of the ovary  67. theca cells of the ovary  68. synovium  69. amygdala  70. pineal gland  71. nucleus of the solitary tract  72. caudal ventrolateral medulla  73. rostral ventrolateral medulla  74. parabrachial nucleus  75. entorhinal cortex  76. pyriform cortex  77. temporal cortex  78. frontal cortex  78. frontal cortex  78. frontal cortex  64. secretion of adrenocorticotropic hormone  64. secretion of testosterone  65. spermatogenesis  66. synthesis of estrogen  67. synthesis of estrogen  68. joint function  69. modulation of emotion  70. regulation of circadian rhythm  71. cardiovascular regulation  72. cardiovascular regulation  73. vasopressor activity  74. taste aversion response and nociceptive response  75. cognition  76. cognition  77. memory acquisition  78. regulation of emotional response and memory acquisition	62. anterior pituitary gonadotropes	62. secretion of follicle stimulating
hormone  64. leydig cells of the testes 65. sertoli cells of the testes 66. granulosa cells of the ovary 67. theca cells of the ovary 68. synovium 69. amygdala 70. pineal gland 71. nucleus of the solitary tract 72. caudal ventrolateral medulla 73. rostral ventrolateral medulla 74. parabrachial nucleus 75. entorhinal cortex 76. pyriform cortex 77. temporal cortex 78. frontal cortex 78. frontal cortex 78. frontal cortex 76. synthesis of estrogen 66. synthesis of estrogen 67. synthesis of estrogen 68. joint function 69. modulation of emotion 70. regulation of circadian rhythm 71. cardiovascular regulation 72. cardiovascular regulation 73. vasopressor activity 74. taste aversion response and nociceptive response 75. cognition 76. cognition 77. memory acquisition 78. regulation of emotional response and memory acquisition		
64. leydig cells of the testes 65. sertoli cells of the testes 66. granulosa cells of the ovary 67. theca cells of the ovary 68. synovium 69. amygdala 70. pineal gland 71. nucleus of the solitary tract 72. caudal ventrolateral medulla 73. rostral ventrolateral medulla 74. parabrachial nucleus 75. entorhinal cortex 76. pyriform cortex 77. temporal cortex 78. frontal cortex 78. frontal cortex 78. frontal cortex 76. sprimatogenesis 64. secretion of testosterone 65. sprimatogenesis 66. synthesis of estrogen 67. synthesis of estrogen 68. joint function 69. modulation of emotion 70. regulation of circadian rhythm 71. cardiovascular regulation 72. cardiovascular regulation 73. vasopressor activity 74. taste aversion response and nociceptive response 75. cognition 76. cognition 77. memory acquisition 78. regulation of emotional response and memory acquisition	63. anterior pituitary corticotropes	63. secretion of adrenocorticotropic
65. sertoli cells of the testes 66. granulosa cells of the ovary 67. theca cells of the ovary 68. synovium 69. amygdala 69. modulation of emotion 69. pineal gland 60. caudal ventrolateral medulla 60. regulation 60. caudal ventrolateral medulla 60. regulation 61. cardiovascular regulation 62. cardiovascular regulation 63. rostral ventrolateral medulla 64. regulation 65. sprimatogenesis 66. synthesis of estrogen 67. synthesis of estrogen 68. joint function 69. modulation of emotion 70. regulation of circadian rhythm 71. rardiovascular regulation 72. cardiovascular regulation 73. vasopressor activity 74. taste aversion response and nociceptive response 75. cognition 76. pyriform cortex 77. cognition 77. temporal cortex 78. frontal cortex 78. regulation of emotional response and memory acquisition		
66. granulosa cells of the ovary 67. theca cells of the ovary 68. synovium 69. amygdala 69. modulation of emotion 69. pineal gland 60. regulation of circadian rhythm 61. nucleus of the solitary tract 62. caudal ventrolateral medulla 63. rostral ventrolateral medulla 64. rostral ventrolateral medulla 65. synthesis of estrogen 66. synthesis of estrogen 67. synthesis of estrogen 68. joint function 69. modulation of emotion 70. regulation of circadian rhythm 71. nucleus of the solitary tract 71. cardiovascular regulation 72. cardiovascular regulation 73. vasopressor activity 74. taste aversion response and nociceptive response 75. entorhinal cortex 76. pyriform cortex 77. cognition 78. frontal cortex 78. regulation of emotional response and memory acquisition		
67. theca cells of the ovary 68. synovium 69. amygdala 69. modulation of emotion 70. pineal gland 70. regulation of circadian rhythm 71. nucleus of the solitary tract 72. caudal ventrolateral medulla 73. rostral ventrolateral medulla 74. parabrachial nucleus 75. entorhinal cortex 76. pyriform cortex 77. temporal cortex 78. frontal cortex 78. frontal cortex 78. frontal cortex 78. regulation of emotional response and memory acquisition		65. spermatogenesis
68. synovium 69. amygdala 69. modulation of emotion 70. pineal gland 70. regulation of circadian rhythm 71. nucleus of the solitary tract 72. caudal ventrolateral medulla 73. rostral ventrolateral medulla 74. parabrachial nucleus 75. entorhinal cortex 76. pyriform cortex 77. temporal cortex 78. frontal cortex 78. frontal cortex 78. regulation 79. modulation of emotion 70. regulation of emotion 71. cardiovascular regulation 72. cardiovascular regulation 73. vasopressor activity 74. taste aversion response and nociceptive response 75. cognition 76. cognition 77. temporal cortex 77. memory acquisition 78. regulation of emotional response and memory acquisition	66. granulosa cells of the ovary	
69. amygdala 70. pineal gland 70. regulation of circadian rhythm 71. nucleus of the solitary tract 72. caudal ventrolateral medulla 73. rostral ventrolateral medulla 74. parabrachial nucleus 75. entorhinal cortex 76. pyriform cortex 77. temporal cortex 78. frontal cortex 78. frontal cortex 79. modulation of emotion 70. regulation of circadian rhythm 71. cardiovascular regulation 72. cardiovascular regulation 73. vasopressor activity 74. taste aversion response and nociceptive response 75. cognition 76. cognition 77. temporal cortex 77. memory acquisition 78. regulation of emotional response and memory acquisition	67. theca cells of the ovary	
70. pineal gland 71. nucleus of the solitary tract 72. caudal ventrolateral medulla 73. rostral ventrolateral medulla 74. parabrachial nucleus 75. entorhinal cortex 76. pyriform cortex 77. temporal cortex 78. frontal cortex 78. frontal cortex 79. regulation of circadian rhythm 71. cardiovascular regulation 72. cardiovascular regulation 73. vasopressor activity 74. taste aversion response and nociceptive response 75. cognition 76. cognition 77. temporal cortex 77. memory acquisition 78. regulation of emotional response and memory acquisition	68. synovium	
71. nucleus of the solitary tract71. cardiovascular regulation72. caudal ventrolateral medulla72. cardiovascular regulation73. rostral ventrolateral medulla73. vasopressor activity74. parabrachial nucleus74. taste aversion response and nociceptive response75. entorhinal cortex75. cognition76. pyriform cortex76. cognition77. temporal cortex77. memory acquisition78. frontal cortex78. regulation of emotional response and memory acquisition	69. amygdala	
72. caudal ventrolateral medulla72. cardiovascular regulation73. rostral ventrolateral medulla73. vasopressor activity74. parabrachial nucleus74. taste aversion response and nociceptive response75. entorhinal cortex75. cognition76. pyriform cortex76. cognition77. temporal cortex77. memory acquisition78. frontal cortex78. regulation of emotional response and memory acquisition		
73. rostral ventrolateral medulla 74. parabrachial nucleus 75. entorhinal cortex 76. pyriform cortex 77. temporal cortex 78. frontal cortex 78. frontal cortex 79. rostral ventrolateral medulla 79. vasopressor activity 70. taste aversion response and nociceptive response 70. cognition 71. temporal cortex 72. memory acquisition 73. vasopressor activity 74. taste aversion response and nociceptive response 75. cognition 76. cognition 77. memory acquisition 78. regulation of emotional response and memory acquisition		
74. taste aversion response and nociceptive response  75. entorhinal cortex  76. pyriform cortex  77. temporal cortex  78. frontal cortex  78. frontal cortex  79. regulation of emotional response and memory acquisition		
nociceptive response  75. entorhinal cortex  76. pyriform cortex  77. temporal cortex  78. frontal cortex  78. frontal cortex  78. regulation of emotional response and memory acquisition		
75. entorhinal cortex75. cognition76. pyriform cortex76. cognition77. temporal cortex77. memory acquisition78. frontal cortex78. regulation of emotional response and memory acquisition	74. parabrachial nucleus	1 · · · · · · · · · · · · · · · · · · ·
76. pyriform cortex76. cognition77. temporal cortex77. memory acquisition78. frontal cortex78. regulation of emotional response and memory acquisition		
77. temporal cortex 77. memory acquisition 78. frontal cortex 78. regulation of emotional response and memory acquisition		
78. frontal cortex 78. regulation of emotional response and memory acquisition	76. pyriform cortex	
memory acquisition		
	78. frontal cortex	
79. parietal cortex 79. visual acuity, touch perception, and		
	79. parietal cortex	/9. visual acuity, touch perception, and



	voluntary movement
80. occipital cortex	80. visual acuity
81. hippocampus	81. learning and memory
82. dentate gyrus	82. learning and memory
83. midbrain reticular formation	83. arousal
84. supraoptic nucleus of the	84. reproductive functions
hypothalamus	
85. magnocellular of the hypothalamus	85. modulation of stress, blood pressure
	and lactation
86. parvocellular neurons of the	86. metabolism
hypothalamus	
87. arcuate nucleus of the hypothalamus	87. release of pituitary hormones
88. trigeminal area	88. cerebral vessel dilation and blood
	pressure
89. cerebral blood vessels	89. cerebral vessel dilation
90. brain stem	90. breathing, heart rate, startle responses,
	sweating, blood pressure, digestion and
	body temperature
91. ventral lamina terminalis	91. blood pressure
92. vagus nerve	92. blood pressure and heart rate
93. nucleus of the solitary tract	93. blood pressure
94. adrenal medulla	94. catecholamine response to stress
95. adrenal cortex	95. stress-induced corticosterone release
96. locus coeruleus	96. arousal and response to stress
97. substantia nigra	97. control of body movement
98. ventral tegmental area	98. control of body movement
99. olfactory bulb	99. odor perception
100. median eminence of hypothalamus	100. pituitary function
101. raphe nuclei	101. sleep and arousal
102. habenula	102. sexual activity
103. cerebellum	103. control of body movement
104. posterior hypothalamus	104. intestinal motility and blood pressure
105. dorsal medulla	105. blood pressure
106. lateral hypothalamus	106. food intake and stomach acid
107	secretion
107. rostral hypothalamus	107. heart rate
108. pontine-medullary reticular formation	108. respiration and heart rate
109. medulla	109. respiration and heart rate
110. mesencephalon	110. heart rate
111. ventral hypothalamus	111. response to stress
112. paraventricular nucleus of	112. response to stress
hypothalamus	1121
113. preoptic area of hypothalamus	113. sexual activity
114. mammillary region	114. food intake
115. perifornical area of hypothalamus	115. food intake
116. ventromedial hypothalamus	116. food intake
117. pons/reticular formation	117. arousal and wakefulness
118. septum	118. emotional control
119. pedunculopontine tegmental nucleus	119. arousal

120. astrocytes	120. neuronal metabolism
121. microglia	121. response to neuronal injury
122. choroid plexus	122. production of cerebrospinal fluid
123. Schwann cells	123. myelination of peripheral nerves
124. endoneurium	124. production of connective tissue nerve
	sheath
125. lateral spinothalamic pathway	125. response to pain and temperature
	stimuli
126. ventral spinothalamic pathway	126. touch sensation
127. dorsal column-medial lemniscal	127. touch sensation
pathway	
128. free nerve endings	128. response to pain and temperature
129. hair follicle endings	129. touch sensation
130. Krause's end-bulb	130. temperature sensation
131. Meissner's corpuscles	131. touch-pressure sensation
132. Merkel's disk	132. touch-pressure sensation
133. Pacinian corpuscle	133. touch-pressure sensation
134. Ruffini's corpuscle	134. temperature sensation
135. retina	135. visual acuity
136. parathyroid gland	136. calcium balance
137. placenta	137. placental activity
138. skeletal muscle fibers	138. muscle contraction
139. copora cavernosum	139. genital vasodilation
140. corticospinal tract	140. movement control
141. motor cerebral cortex	141. movement control
142. postganglionic neurons	142. control of blood pressure and adrenal
	activity
143. intramural ganglion	143. distal colon peristalsis
144. hypogastric plexus	144. control of urethral and anal sphincters
145. pelvic plexus	145. genital vasodilatation and penile
	erection
146. vesical plexus	146. urinary bladder control
147. celiac plexus	147. intestinal peristolisis

- (c) contacting a non-endogenous candidate compound with said endogenous constitutively activated G protein coupled cell surface receptor of step (a);
- (d) determining, by measurement of the compound efficacy at said contacted receptor, whether said non-endogenous candidate compound has inverse agonist activity or agonist activity to said receptor of step (a); and
- (e) directly identifying a non-endogenous candidate compound of step (d) having inverse agonist activity as an inverse agonist to said receptor of step (a), or having agonist activity as an agonist to said receptor of step (a);
- (f) selecting an inverse agonist to reduce a selected physiological function of step (b) correlated with the tissue-expression location for said receptor of step (a), or selecting an